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(71) Applicant (for all designated States except US): DESIGN-
QUIK L.L.C. [US/US]; 21452 West Oak Trail, Kildeer, IL
60047 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): CONTE, August
[US/US]; 21452 West Oake Trail, Kildeer, IL 60047 (US).
STILWELL, Thomas, Duncan [US/US]; 26900 Wolf
Road, Bay Village, OH 44140 (US). CONTE, Anthony,

Marion [US/US]; 259A Windsor Court, South Elgin, IL
60177 (US).

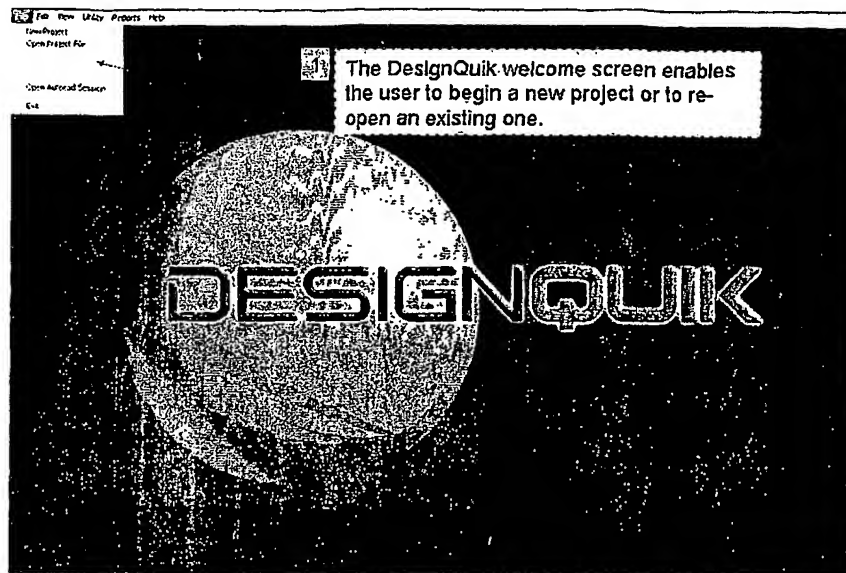
(74) Agent: PANIAGUAS, John, S.; Katten Muchin Zavis
Rosenman, Suite 1600, 525 West Monroe, Chicago, IL
60661-3693 (US).

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[Continued on next page]

(54) Title: INTEGRATED COMPUTER AIDED DESIGN TOOL



(57) Abstract: A computer Aided Design (CAD) tool is configured as an add on tool for an architectural design system, such as AutoCAD, to form an integrated design tool for designing various building systems, such as fire detection and alarm. The integrated design tool facilitates the design of fire detection and alarm systems for buildings without the need to duplicate any of the architectural designs. By configuring the system as an add-on tool, various problems associated with known design tools configured as stand alone CAD systems are avoided. One important feature of the invention is that the system is configured to automatically generate riser diagrams as well as eliminate a number of manual tasks normally associated with the system. Thus, the system in accordance with the present invention not only avoids duplication of the architectural drawings but facilitates the entire fire protection design for a building.

WO 2005/033912 A2



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INTEGRATED COMPUTER AIDED DESIGN TOOL

COMPUTER APPENDIX

[0001] This application includes a Computer Listing Appendix on compact disc, hereby incorporated by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates to a Computer Aided Drafting (CAD) tool and more particularly to a CAD tool that is adapted to be integrated into a known CAD system used for architectural design, such as the AutoCad system, in order to provide increased functionality of the architectural CAD system and specifically to facilitate the design of various building systems, such as a fire detection and alarm system, and enable the building system design to be incorporated on architectural drawings prepared by way of the architectural CAD system and additionally automate many aspects of the overall system design.

2. Description of the Prior Art

[0003] Various computer aided design systems are known. For example, computer aided fire protection systems are generally known in the art. Such fire protection systems fall into two categories: fire detection and alarm systems and fire protection sprinkler system. For example, U.S. Patent No. 6,131,077; 5,227,983 and 5,557,537 relate to a stand alone CAD fire protection sprinkler system which

automatically routes various conduit systems, such as pipes, conduits and the like. The system disclosed in the '077 patent can be used for automatic layout, for example, of a fire protection sprinkler system, lighting system, HVAC system as well as various other systems. Unfortunately, the fire protection system disclosed in the '077 patent is configured as a stand alone CAD system. Since the fire protection design is normally layered on top of architectural floor plans, the architectural details of the building must be incorporated into the stand alone CAD system disclosed in the '077 patent. In situations where the architectural drawings have been done on another CAD system, the architectural details must be duplicated in the fire protection CAD system.

[0004] Computer aided fire detection and alarm systems are also known. For example, M.E.P. CAD, Inc. provides a computer aided fire detection and alarm system, known as AlarmCad (<http://www.alarmcad.com>). The AlarmCad system is also a stand alone CAD system. Although the AlarmCAD system allows for import and export of AutoCAD drawings, there are several problems with the AlarmCAD system. First, the AlarmCad system is configured as a stand alone CAD system, thus making it relatively expensive. Second, import of AutoCAD drawings into the AlarmCAD (or any other CAD system for that matter) is not perfect. Thus, once the drawings have been imported, the user will likely need to edit the drawings, which can be time consuming and cumbersome. Third, since the AlarmCAD system is a stand alone system, a user must be familiar with two CAD systems; AutoCAD and AlarmCAD. Fourth, the AlarmCAD stand alone system may not be compatible with later updates of AutoCAD and may not be able to emulate later revisions for several reasons. One reason is that newer implementations of AutoCAD are likely proprietary, thus resulting in corresponding updated versions of AlarmCAD lagging behind updated versions of the AutoCAD system. Another reason is that the updated versions of AutoCAD may be protected by Intellectual Property rights preventing the AlarmCAD stand alone CAD system from emulating the new changes in the AutoCAD system.

[0005] In order to avoid the problems mentioned above, one known system has been developed and is configured as an add on tool for a extremely well known architectural computer aided drafting system, known as AutoCad. This add on tool is disclosed in U.S. Patent No. 4,885,694. The add on tool, disclosed in the '694 patent, enables various devices, such as fire protection equipment, to be located on layout drawings that were originally created using the AutoCad system. As is known in the art, AutoCad is probably the most popular CAD system for architectural design. Thus, drawings that have been created in the AutoCad system need not be duplicated and may be simply imported into the AutoCAD system which incorporates the add on tool. Moreover, the problems mentioned above associated with stand alone CAD systems are avoided. The system disclosed in the '694 patent allows the various devices, such as fire detection and alarm devices, to be easily located on layout drawings. The system automatically inventories all of the fire protection equipment and creates a bill of material as well as a labor and material estimate. However, the system disclosed in the '694 patent still requires many of the tedious tasks normally performed in connection with a fire detection and alarm system to be formed manually, thus making the use of the fire protection add on tool disclosed in the '694 patent tedious. Thus, there is a need for a design tool which not only eliminates duplication of architectural drawings and avoid the problems associated with updates of the AutoCAD design system but also facilitates the fire protection design.

SUMMARY OF THE INVENTION

[0006] Briefly, the present invention relates to a Computer Aided Design (CAD) tool, configured as an add on tool for an architectural design CAD system, such as AutoCAD, to form an integrated design tool for designing various building systems, such as fire detection and alarm. The integrated design tool facilitates the design of, for example, a fire detection and alarm system, for a building without the need to duplicate any of the architectural designs. By configuring the system as an add-on tool, various

problems associated with known design tools configured as stand alone CAD systems are avoided. In one embodiment of the invention, the integrated design tool incorporates a fire protection icon for fire detection and alarm devices located, for example, on the AutoCAD task bar. This icon is provided with click and place functionality. In order to place a piece of equipment, for example, fire detection and alarm equipment, on the floor plan, the user simply clicks on the icon and places it at the desired location. In addition, the integrated design tool automates many of the tedious tasks normally associated with the rest of the overall system design. For example, one important feature of the invention is that the system is configured to automatically generate riser diagrams as well as eliminate a number of manual tasks normally associated with the system. Thus, the system in accordance with the present invention not only avoids duplication of the architectural drawings but facilitates the entire fire protection design for a building.

DESCRIPTION OF THE DRAWINGS

[0007] These and other advantages of the present invention will be readily understood with reference to the following specification and attached drawings wherein:

[0008] FIGS. 1-30 illustrate exemplary screen shots which demonstrate the functionality and use of the integrated fire detection and alarm system design tool in accordance with the present invention.

[0009] FIGS. 31-58 illustrate additional exemplary screen shots which further demonstrates the functionality and use of the present invention.

DETAILED DESCRIPTION

[0010] The present invention relates to a Computer Aided Drafting (CAD) tool for designing various systems, such as fire detection and alarm systems. Although the invention is described and illustrated with respect to a fire detection and alarm system, the breadth of the invention is applicable to various building systems, for example, low voltage systems, such as security systems, CCTV systems, as well as higher voltage

systems, such as lighting systems, electrical systems, and virtually any system which incorporates conduit, electrical or fluid, between devices. The design tool in accordance with the present invention is configured as an add on tool for an existing architectural design CAD system, such as AutoCAD, which facilitates the design of, for example, the fire detection and alarm system, for a building within the AutoCad environment. By configuring the system as an add on tool, duplication of architectural drawings is thus eliminated. In addition, the system in accordance with the present invention facilitates the design of the balance of the system design by way of a click and place function allows fire detection and alarm devices, for example, to be added to the architectural floor plans by clicking and placing icons in the desired location on the floor plan. In accordance with other features of the invention, the system automates many of the other tedious tasks normally associated with designing a fire detection and alarm system for a building. These tasks include:

- Linking of floor plan drawings. In the creation of a complete, for example, fire detection and alarm system design, multiple floor plan drawings are required. After the individual drawings have been created the design tool in accordance with the present invention simply links the drawings updating references to each other and correcting any conflicts.
- Automatic creation of riser drawings. The system automatically creates riser drawings from the floor plan.
- Automatic creation of point to point drawings. Point to point wiring diagrams are automatically created.
- Automatic creation of control equipment drawings. The integrated design tool creates detailed control equipment drawings.
- Creation of control equipment programming databases. Most fire alarm control equipment is microprocessor based and requires that it be programmed to accommodate

the devices connected to it by way of a system wiring network. The integrated design tool automatically creates the required control equipment programming database.

- Creation of reports. The integrated design tool automatically creates various reports as well as makes calculations for circuit loading, voltage drop decibel loss and tabulates wire and conduit lengths for material ordering purposes as well as the quantity of devices and material for labor estimating.

- Creation of technical manuals. The integrated design tool automatically creates technical manual by assembling pertinent catalog and data sheets stored in a user database.

- Automation of drawing tasks. Tasks that have been performed manually historically are automatically performed by the integrated tool. Some examples of these tasks include placement on drawings of fire alarm device information, such as device sequence number and circuit number. Another example relates to manual entry of wire fill information.

- Capture of design information during drawing preparation. Conventionally, the design of fire alarm and other low voltage systems is done during drawing preparation. This information is known to be transferred by manual means by other project documents and to the system software configuration. The add on design tool captures the design information as it is placed on the drawing, thereby reducing or eliminating the need for manually counting the devices, measuring distances and totaling these quantities during project activities. For example, the traditional method for generating a bill of materials and purchasing the equipment is done by counting devices and panels on the drawings and entering them on handwritten or electronic spread sheet.

- Linking design documentation to other project activities. This feature allows the integrated add on design tool to import field changes back on to the design documents. For example, changes to the system software made on the spot to accommodate

changes in the as built conditions can be imported back into the integrated fire protection design tool to automate the corresponding drawing changes.

- Linking multiple unrelated electronic drawing files into a cohesive drawing set.

Although AutoCAD and other computer aided design software provides the ability to prepare project drawings in a related manner, most project drawings are prepared as separate, unrelated files. For example, high rise building drawings are prepared as individual floor plan drawings. The integrated fire detection and alarm design tool provides a facility to build a list of these project drawings and other facilities and identify them as a single project. For example, a fire alarm circuit that is connected to smoke detectors on multiple floors must have sequence numbers on one floor drawing that do not duplicate the sequence numbers on another floor drawing. Another example is that the project that has a separate circuit of smoke detectors. The circuit numbers must be coordinated such that there is no duplication. Although the drawings continue to exist as separate files, the integrated fire protection system coordinates circuit and device sequences to avoid conflict and duplication.

[0011] FIGS. 1-58 illustrate examples of how the integrated fire protection design tool can be used to facilitate the design of a fire detection and alarm system. The computer appendix provides an exemplary implementation of this tool for an exemplary fire detection and alarm system.

[0012] Obviously, many modifications and variations of the present invention are possible in light of the above teachings. Thus, it is to be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically described above.

CLAIMS

1: A Computer Aided Drafting (CAD) tool comprising:

an interface for enabling said CAD tool to added on to an existing CAD program; said interface configured to selectively enable riser diagrams to be automatically generated from existing layout drawings created in said existing CAD programs.

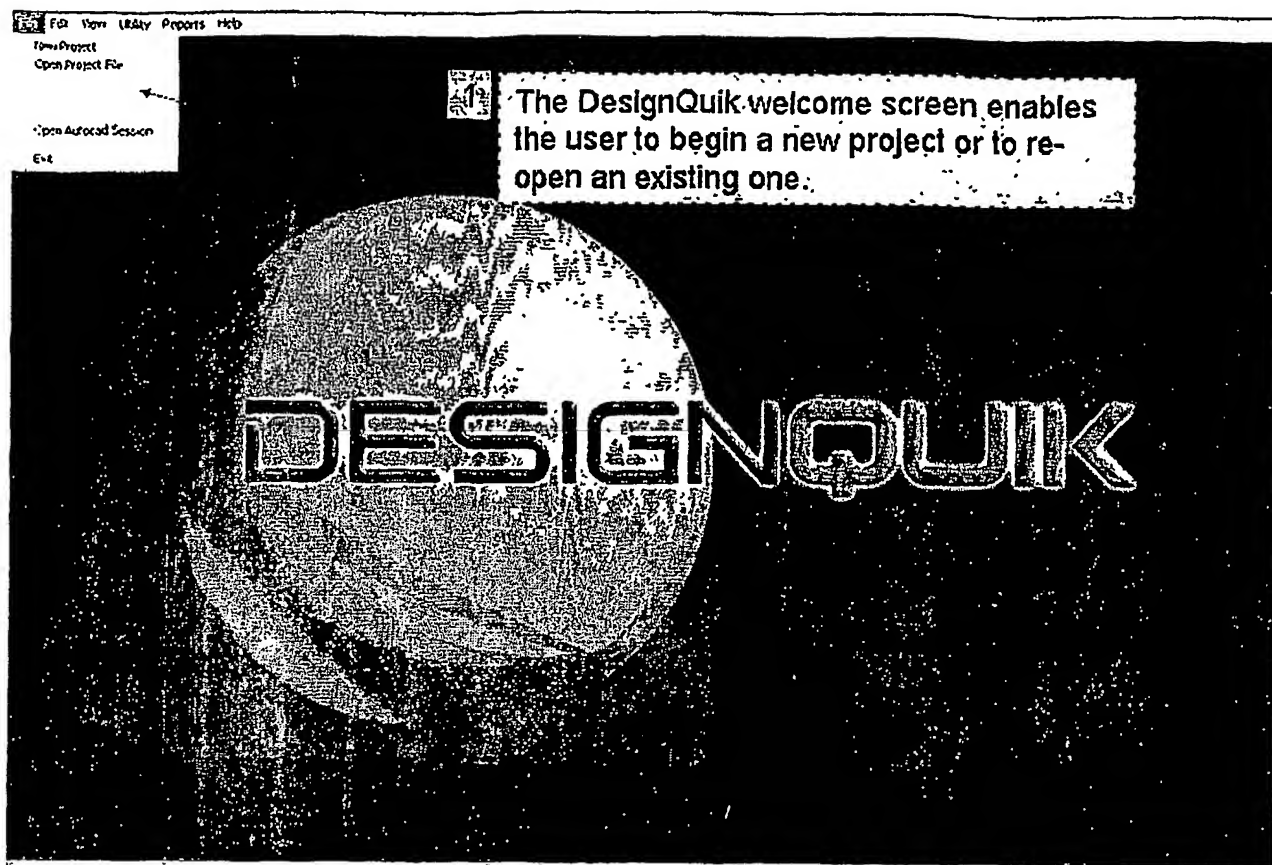


FIG. 1

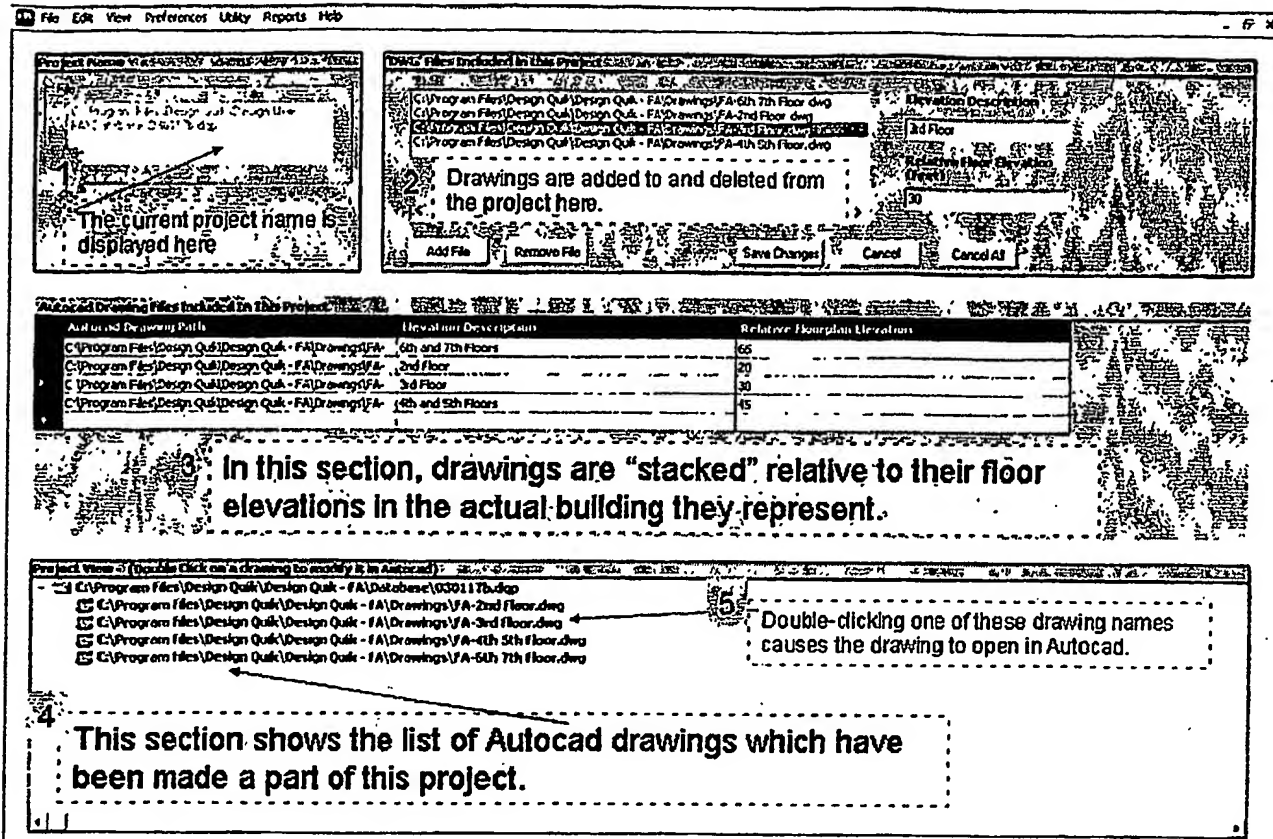


FIG. 2

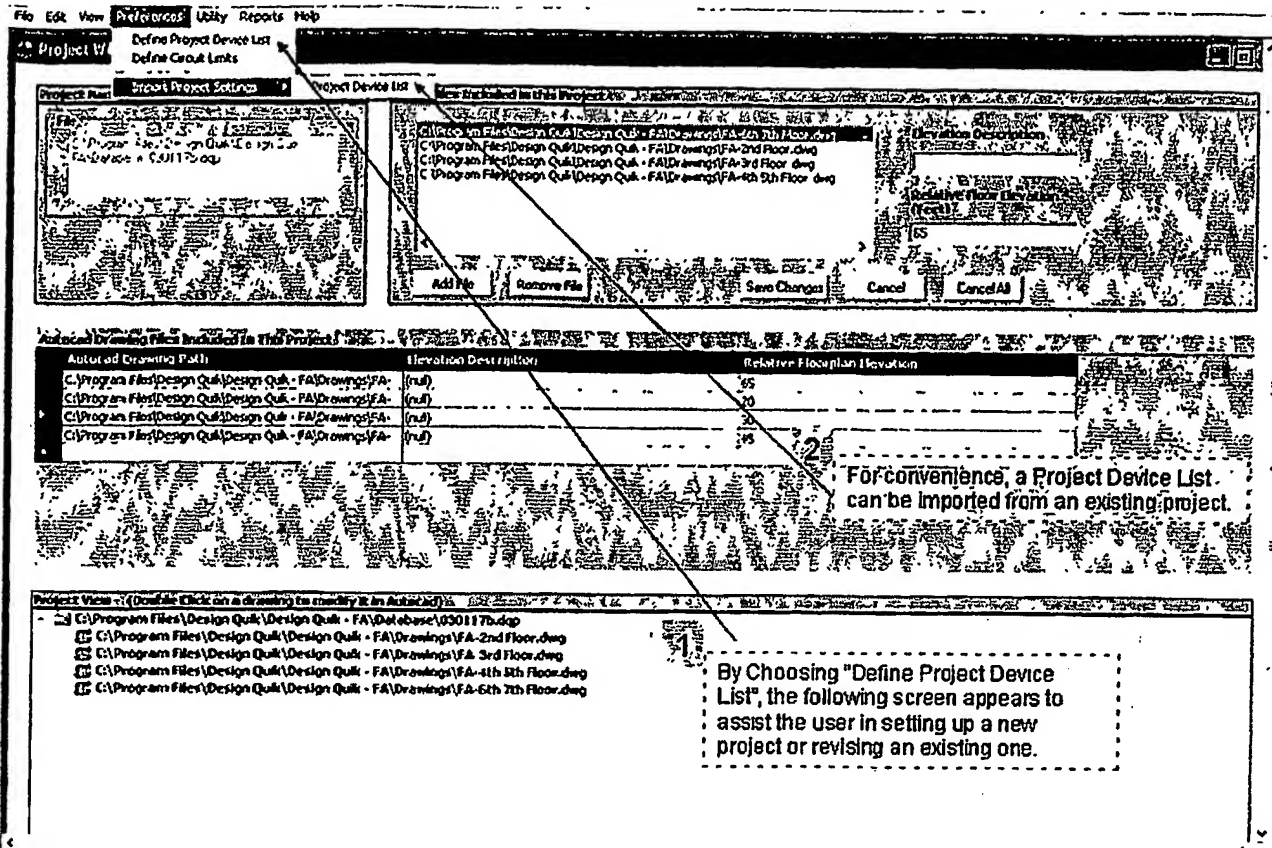


FIG. 3

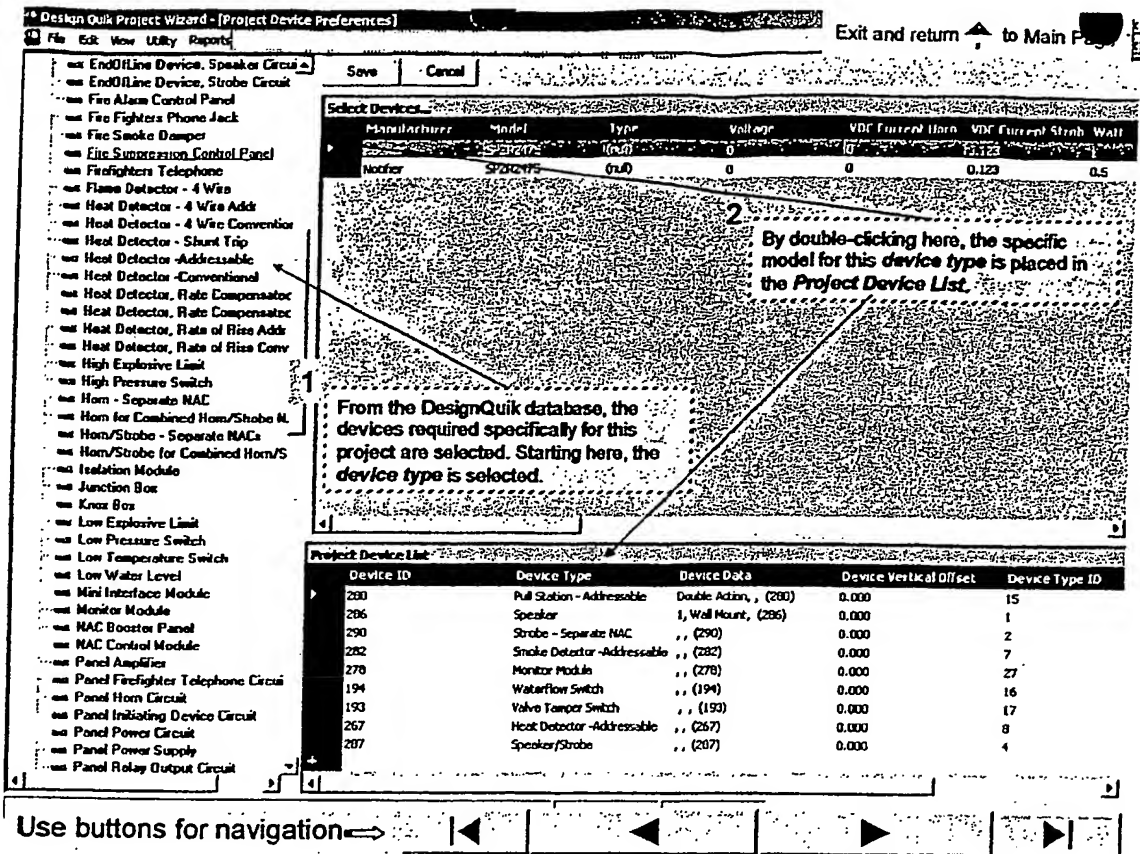


FIG. 4

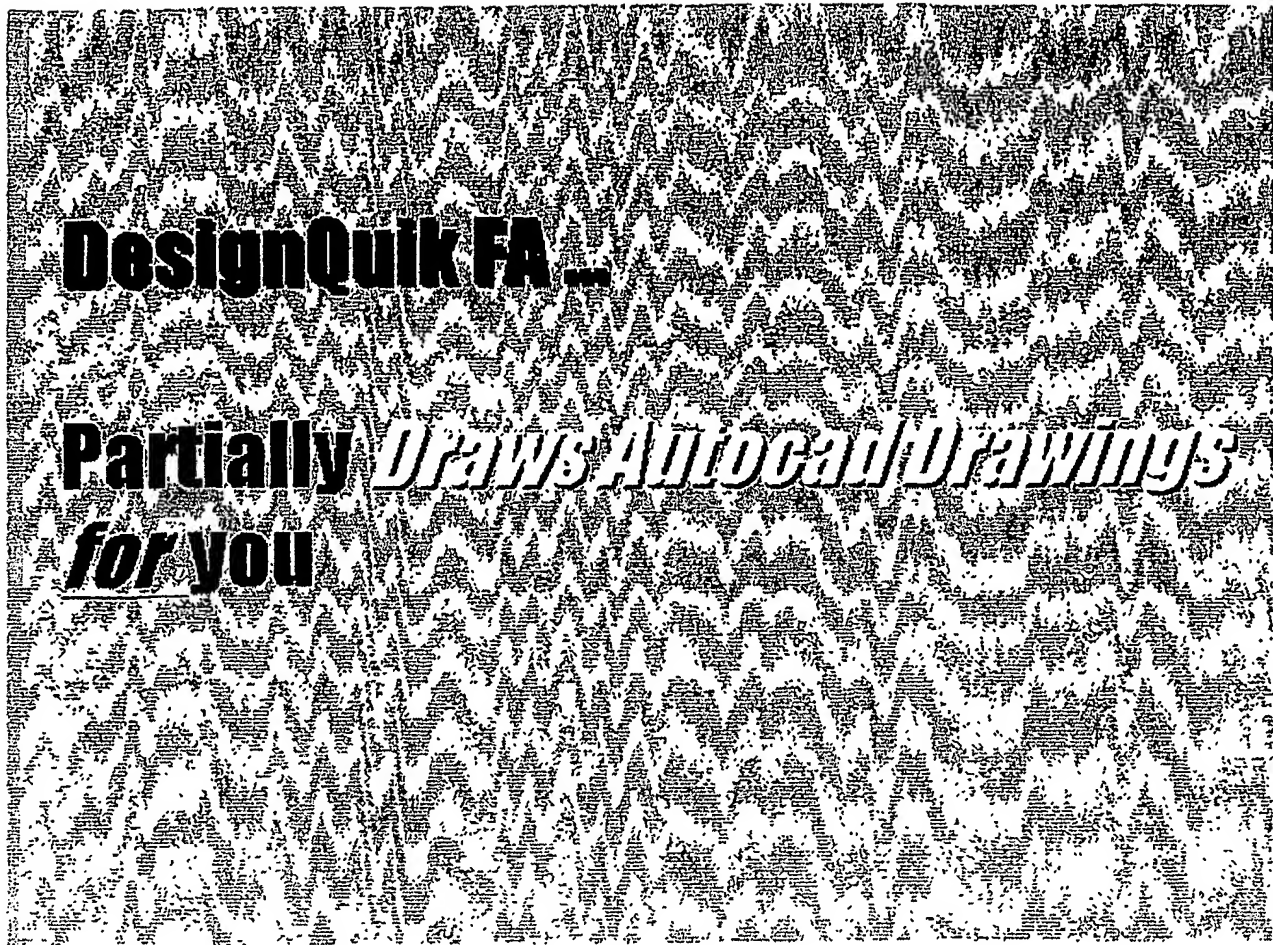


FIG. 5

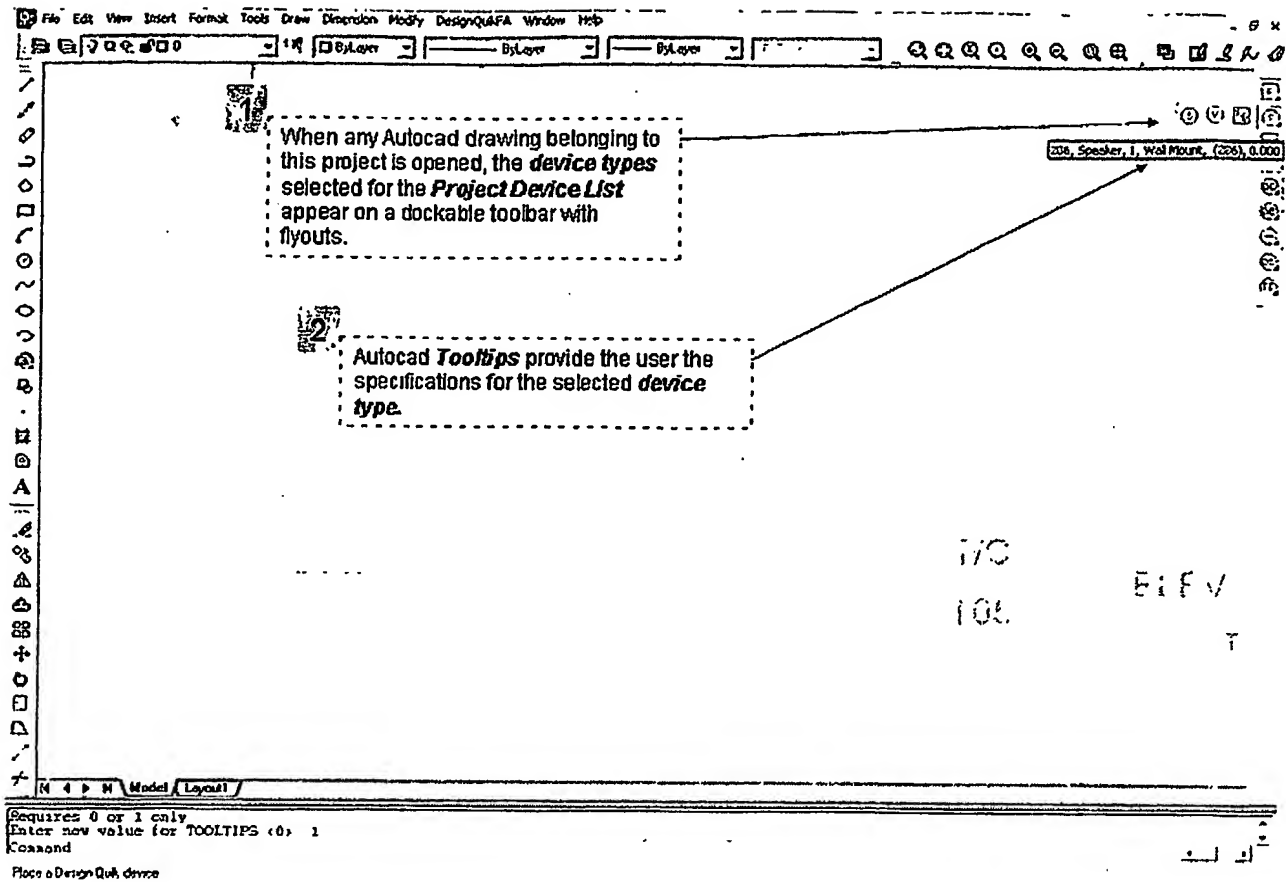


FIG. 6

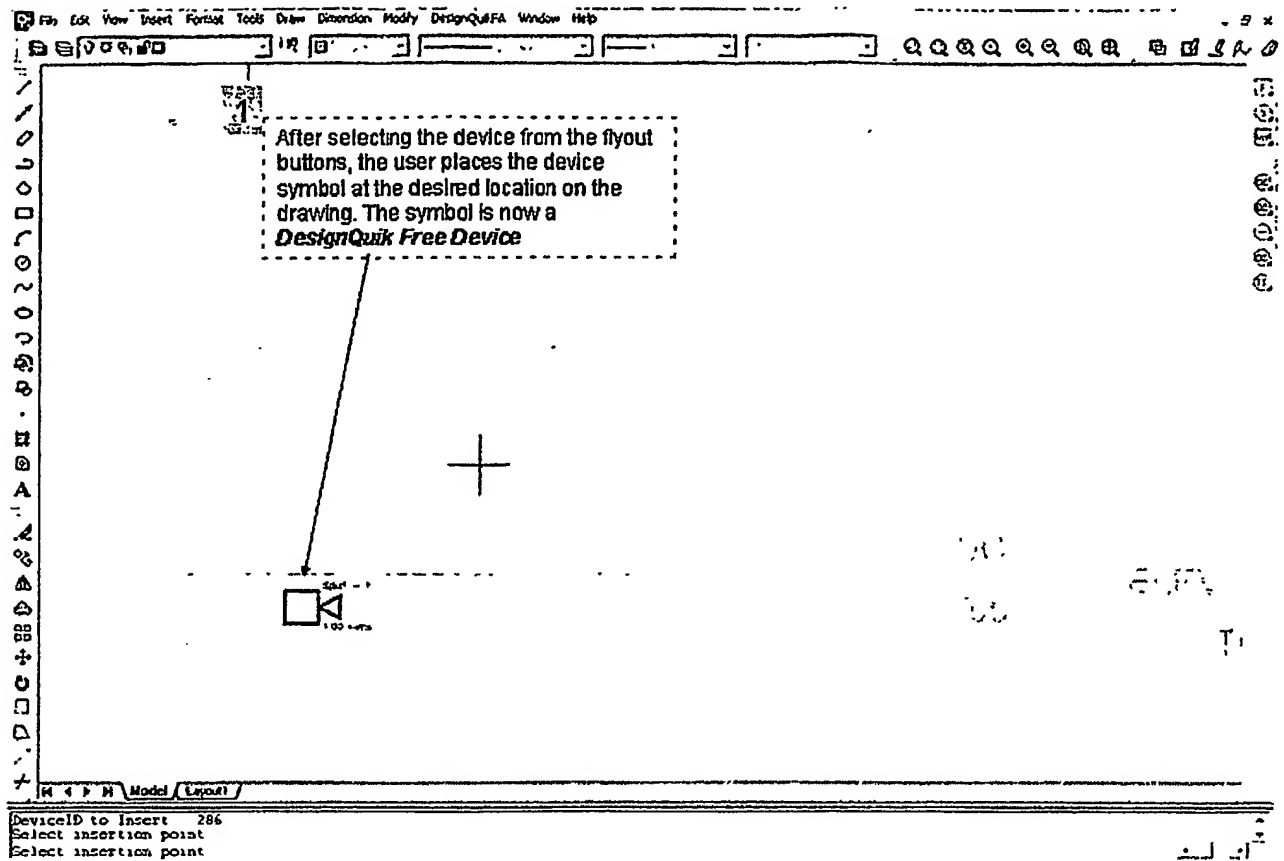


FIG. 7

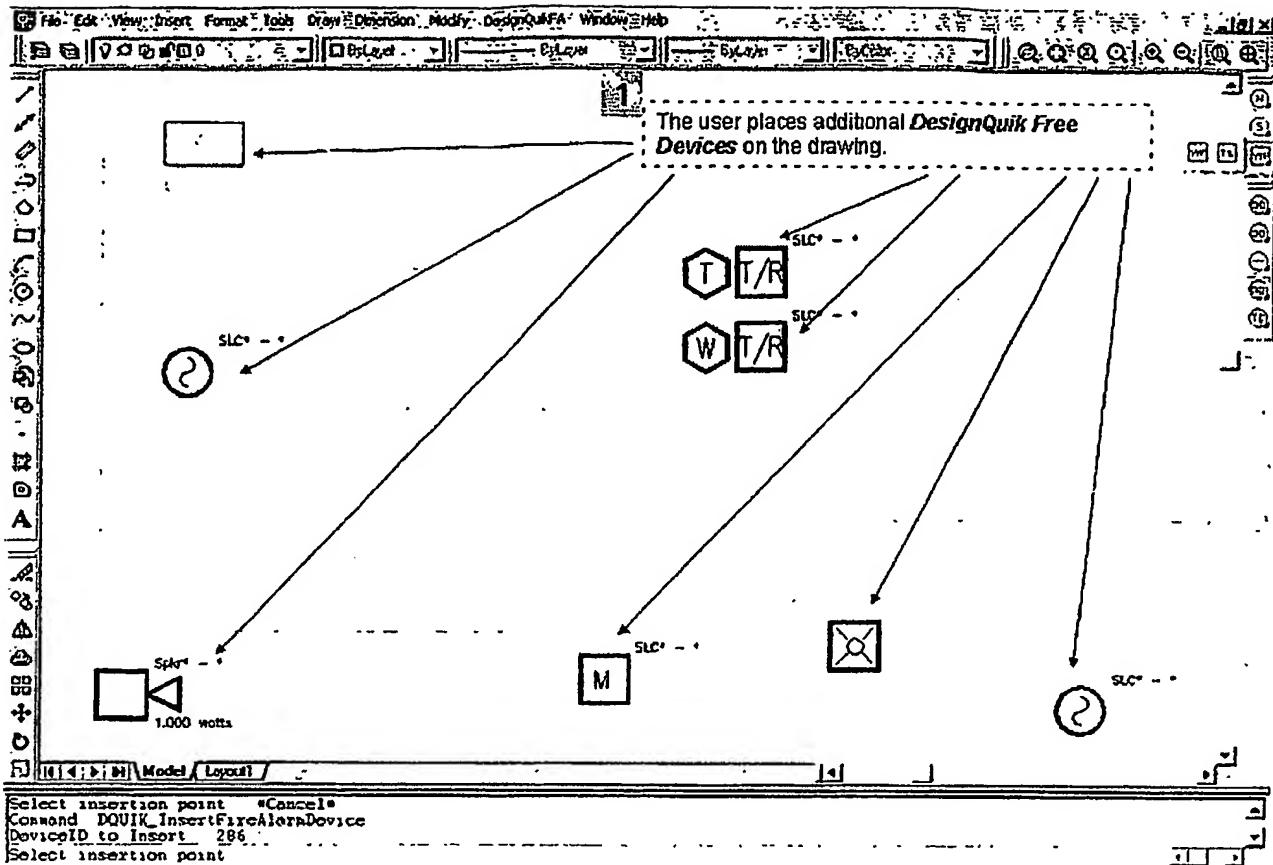


FIG. 8

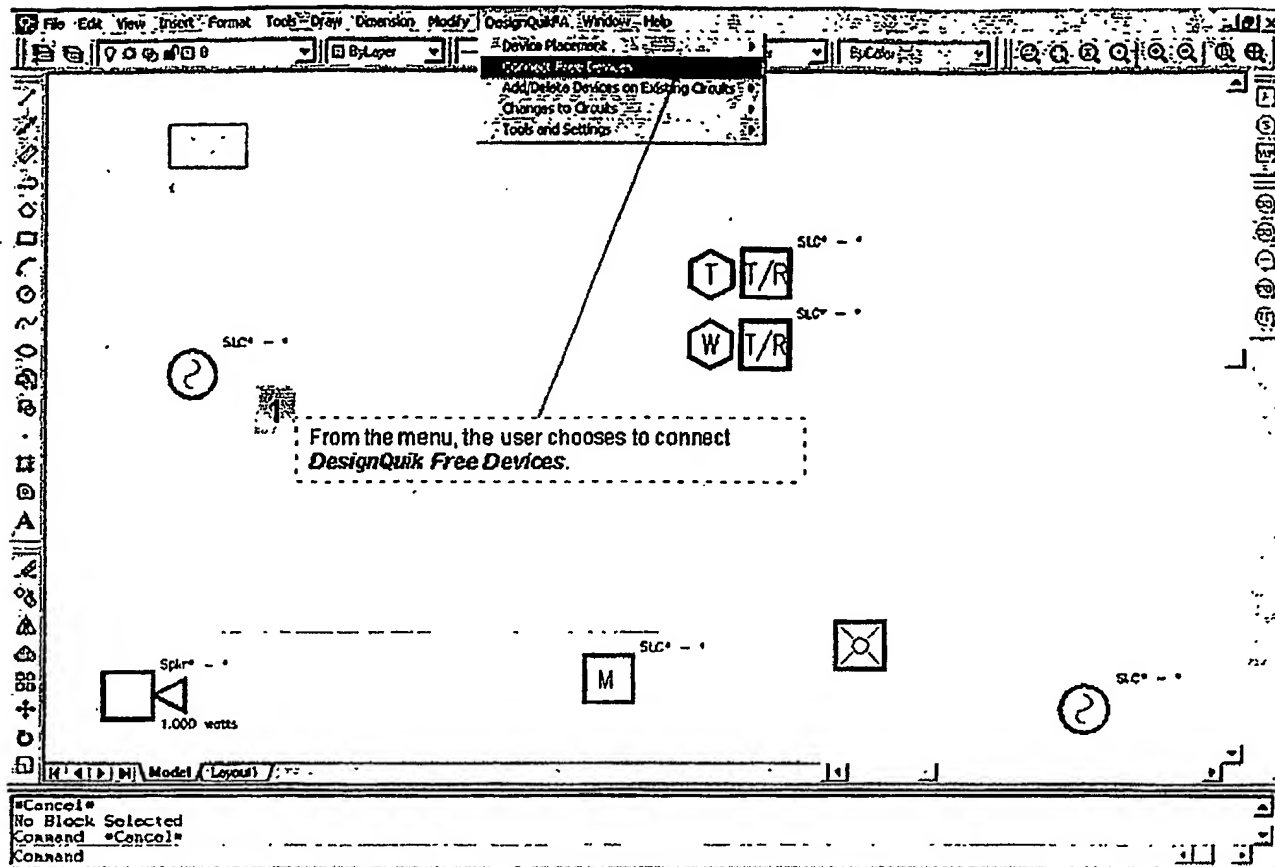


FIG. 9

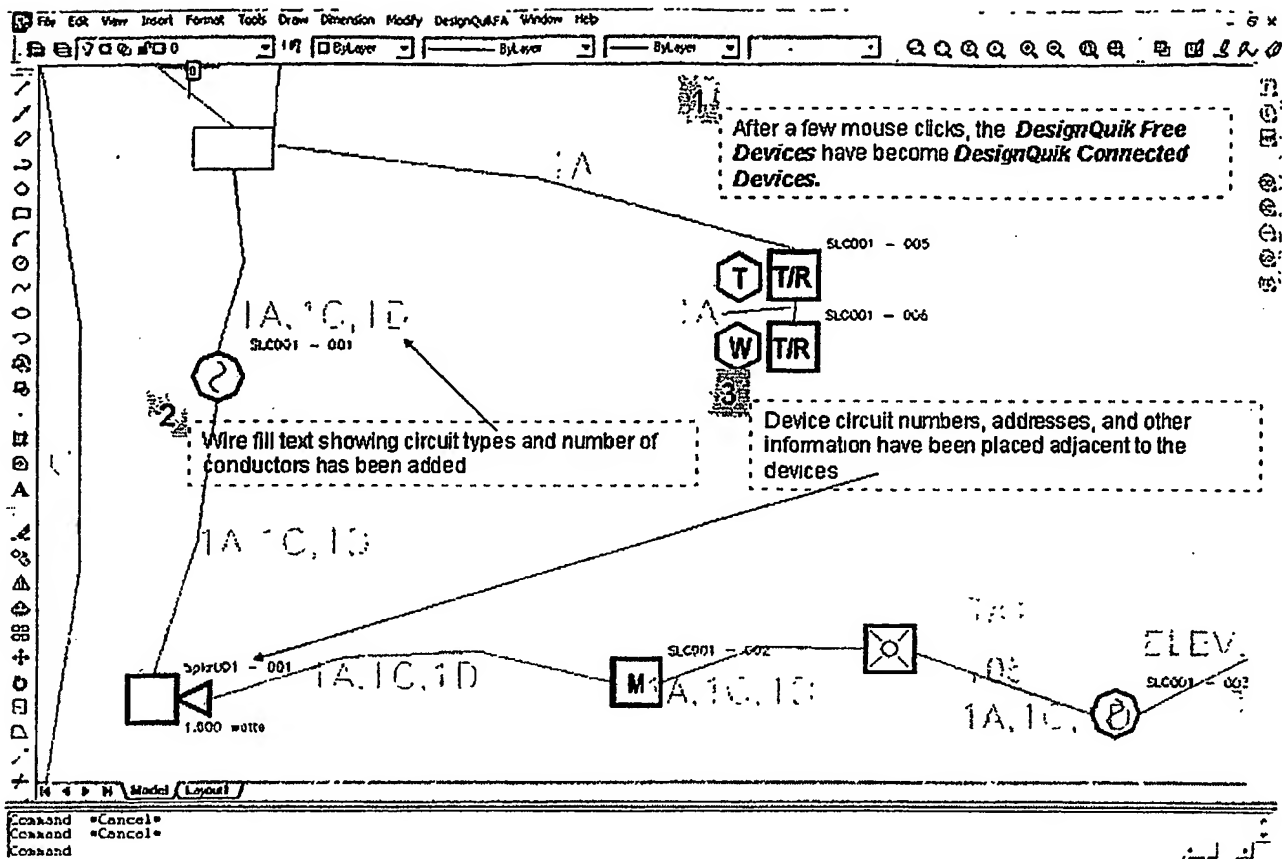


FIG. 10

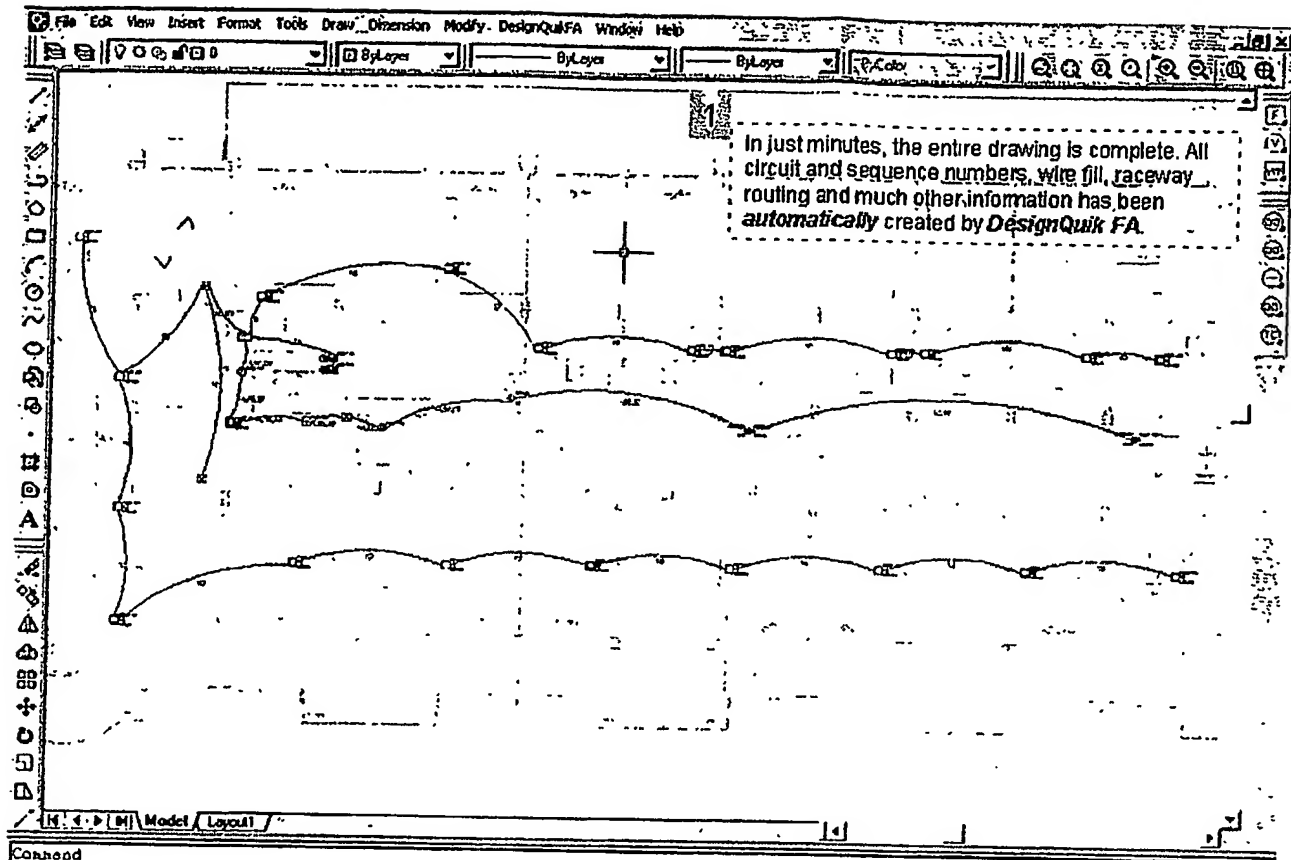
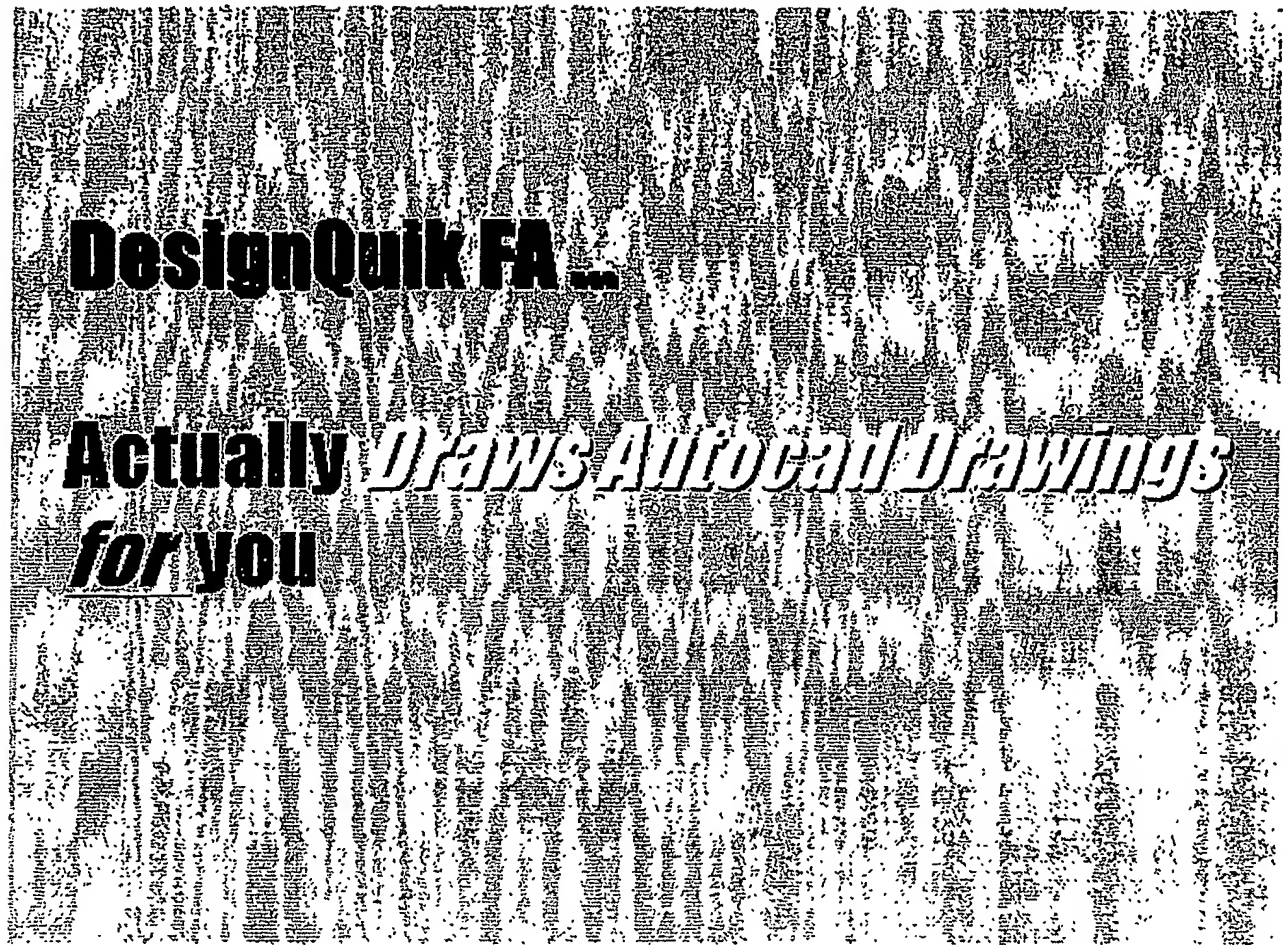


FIG. 11



DesignQuik FA...

**Actually *Draws AutoCAD Drawings*
for you**

FIG. 12

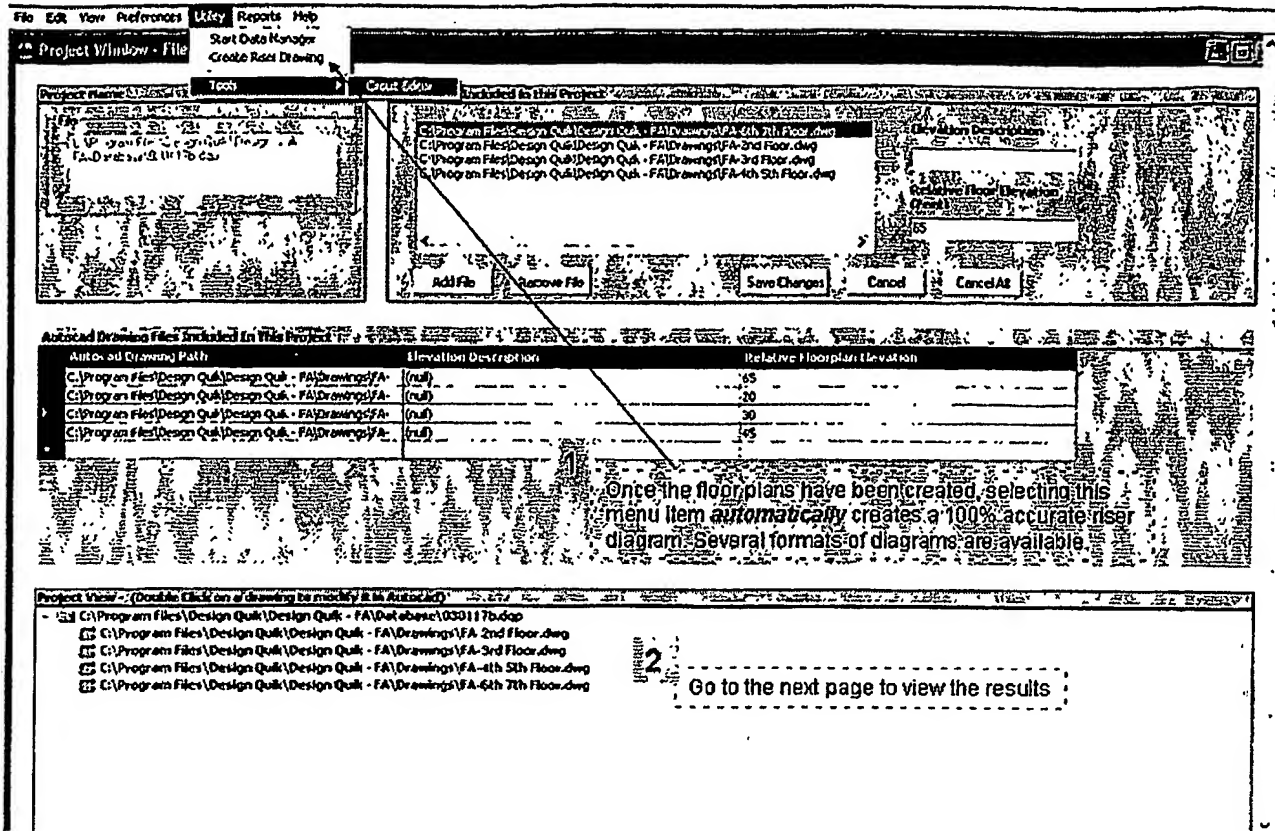


FIG. 13

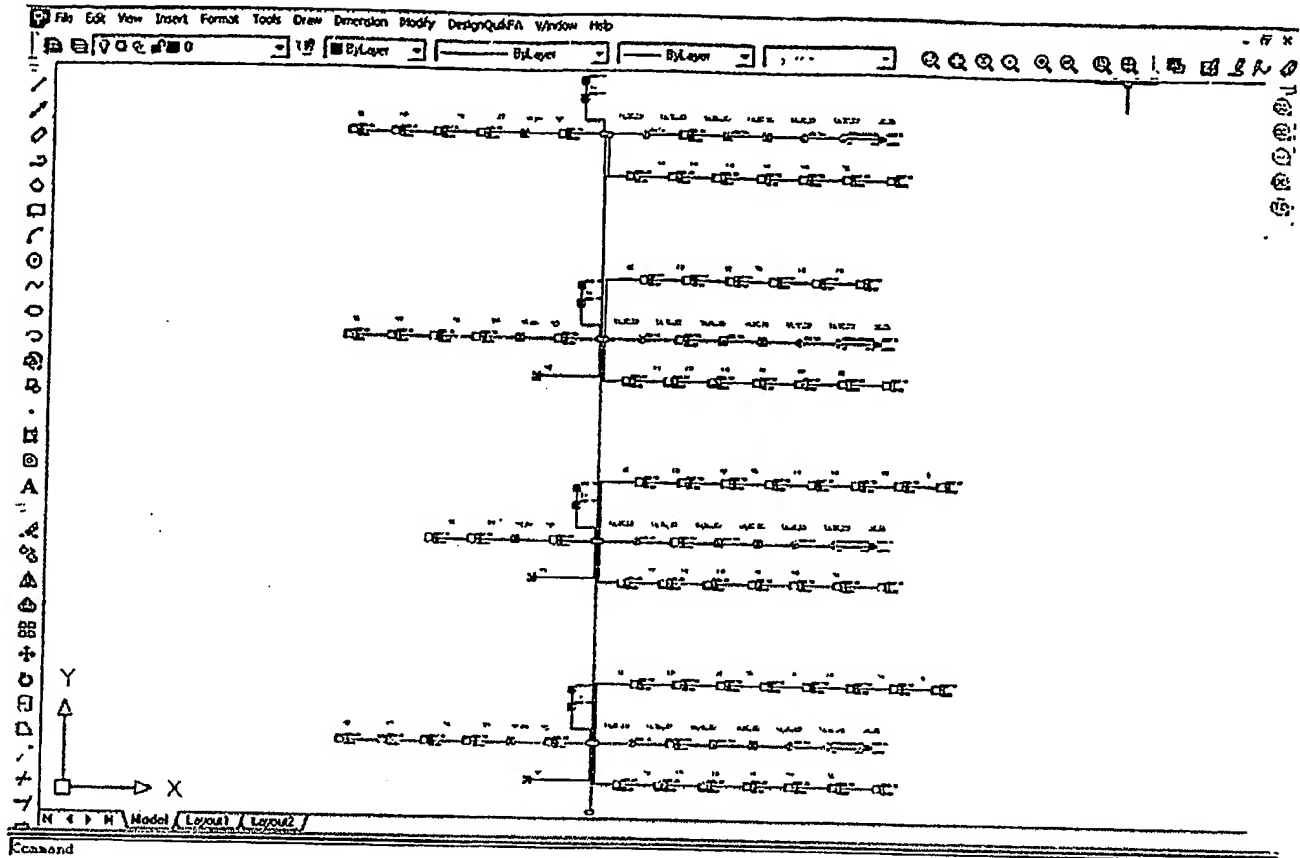
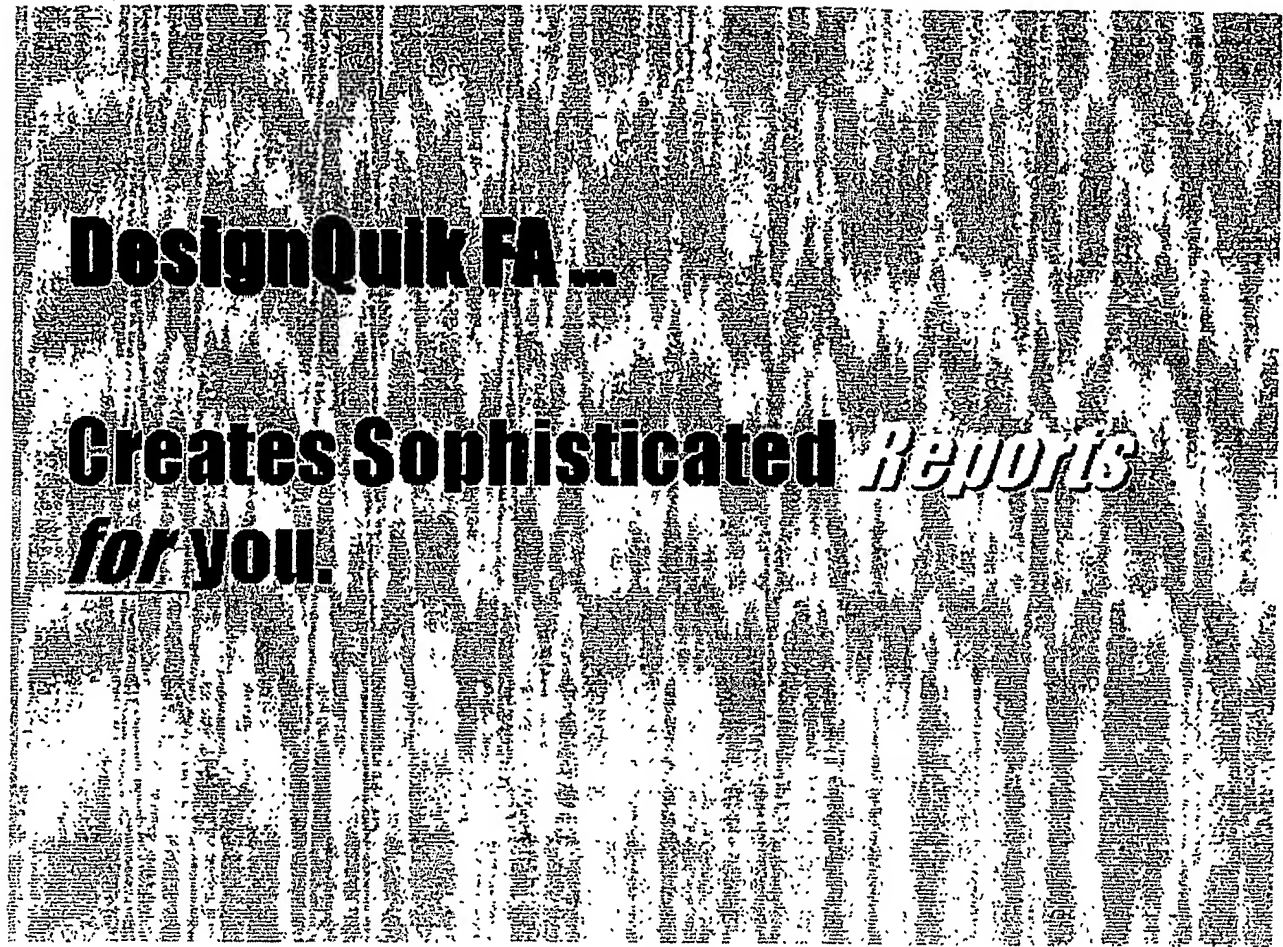


FIG. 14



DesignQuik FA...

**Creates Sophisticated *Reports*
*for you.***

FIG. 15

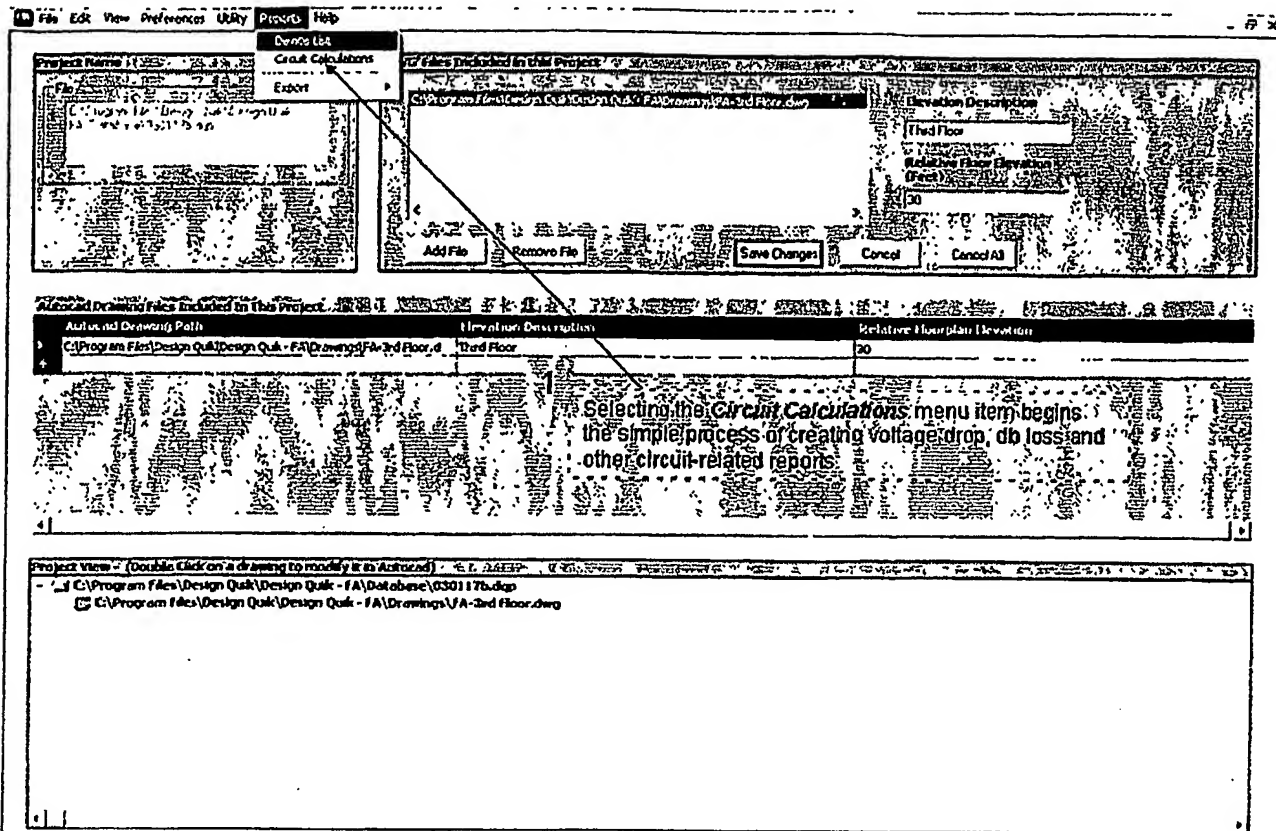


FIG. 16

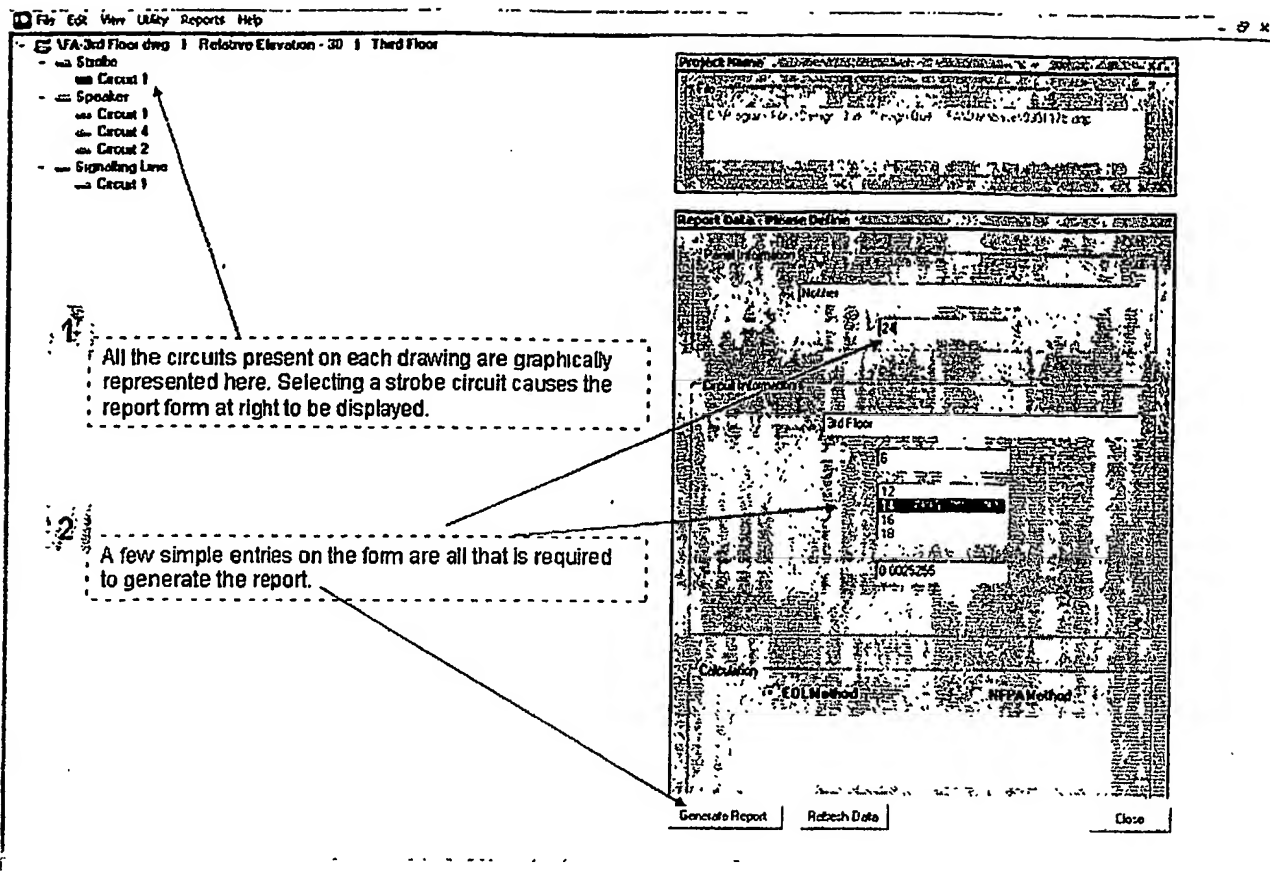


FIG. 17

File Edit View Insert Format Tools Data Window Help

027

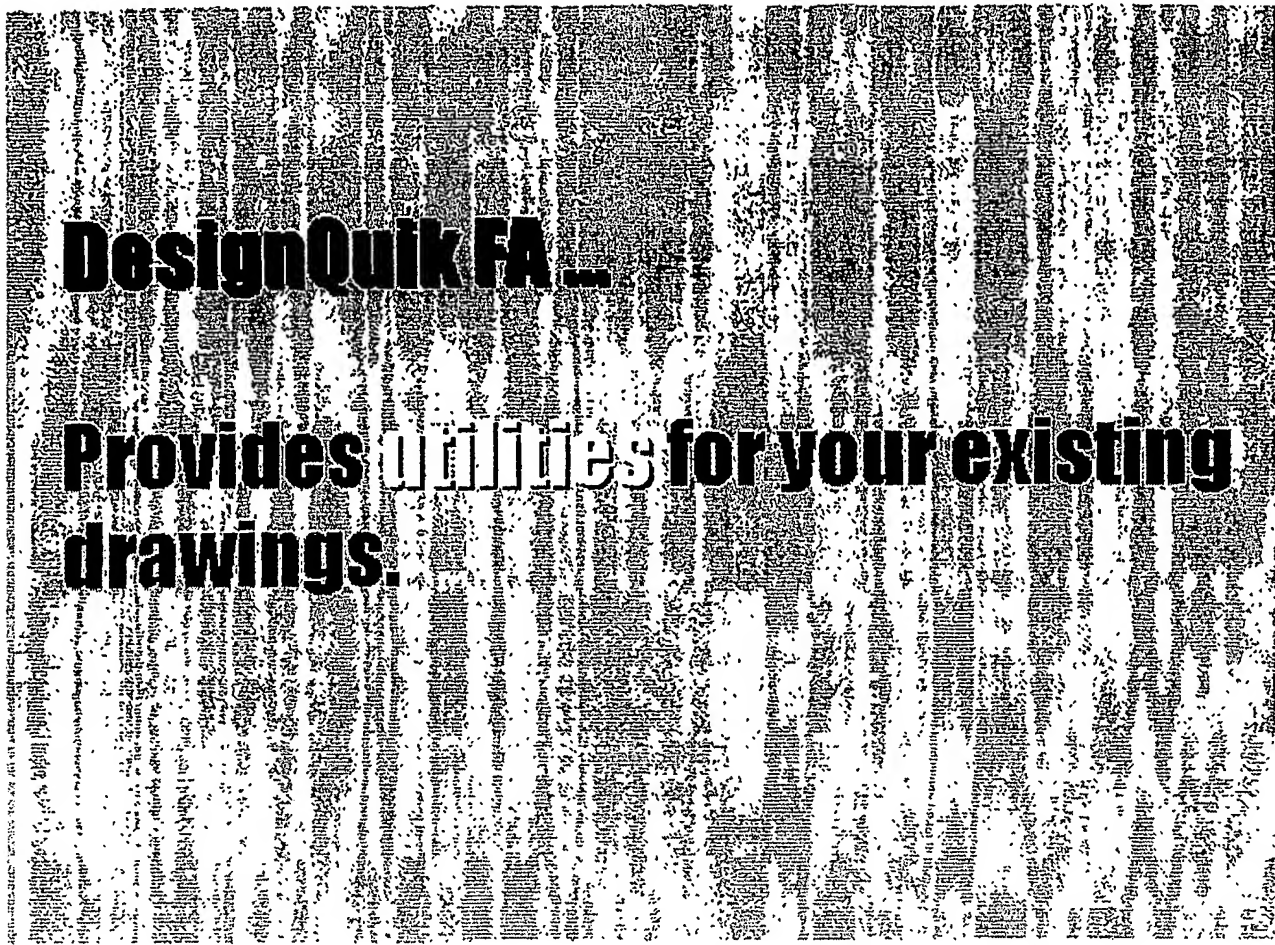
A	B	C	D	E	F
1	Project Name:	030118a.dgp			
2	Drawing Name	FA-3rd Floor Revised dwg	Applied Panel Voltage	24	Circuit Capacity (Amps) 8
3	Panel Type		Voltage at last device	16 1657502	Power Used 0 615 Amps
4	Circuit No	1	Wire Size(AWG)	14	% of Capacity 10 25%
5	Circuit Type	Strobe	Resistance(Ohms per ft)	0 0025255	
6	Circuit Location				

Device No.	Device Current (Amps)	Segment Length from Previous Device (Feet)	Current on Circuit Segment (Amps)	Voltage Drop (Volts DC)	Applied Voltage at Last Device (Volts DC)
9	V-001-1	0.165	58 51928087	0.825	0 618525013
10	V-001-2	0 165	57 10702087	0 86	0 48131683
11	V-001-3	0 165	58 78065003	0 485	0 377838375
12	V-001-4	0 165	125 6505573	0 33	0 529512728
13	V-001-5	0 165	20 13673958	0 185	0 042429782
14					
15	Total Current (Amps)	0.825		Total Voltage Drop	2.047672826
16					
17					
18					
19	The appropriate report for the circuit type selected is generated.				
20					
21					
22					
23	•Voltage drop calcs for NAC circuits				
24	•DB loss calcs for speaker circuits				
25					
26					
27	2 The report is generated in Microsoft Excel format				
28	Customizable for your needs.				
29					
30					
31					
32					
33					
34					
35					

Ready Voltage Drop /

(2) Windows Explorer

FIG. 18



DesignQuik FA...

Provides utilities for your existing drawings.

FIG. 19

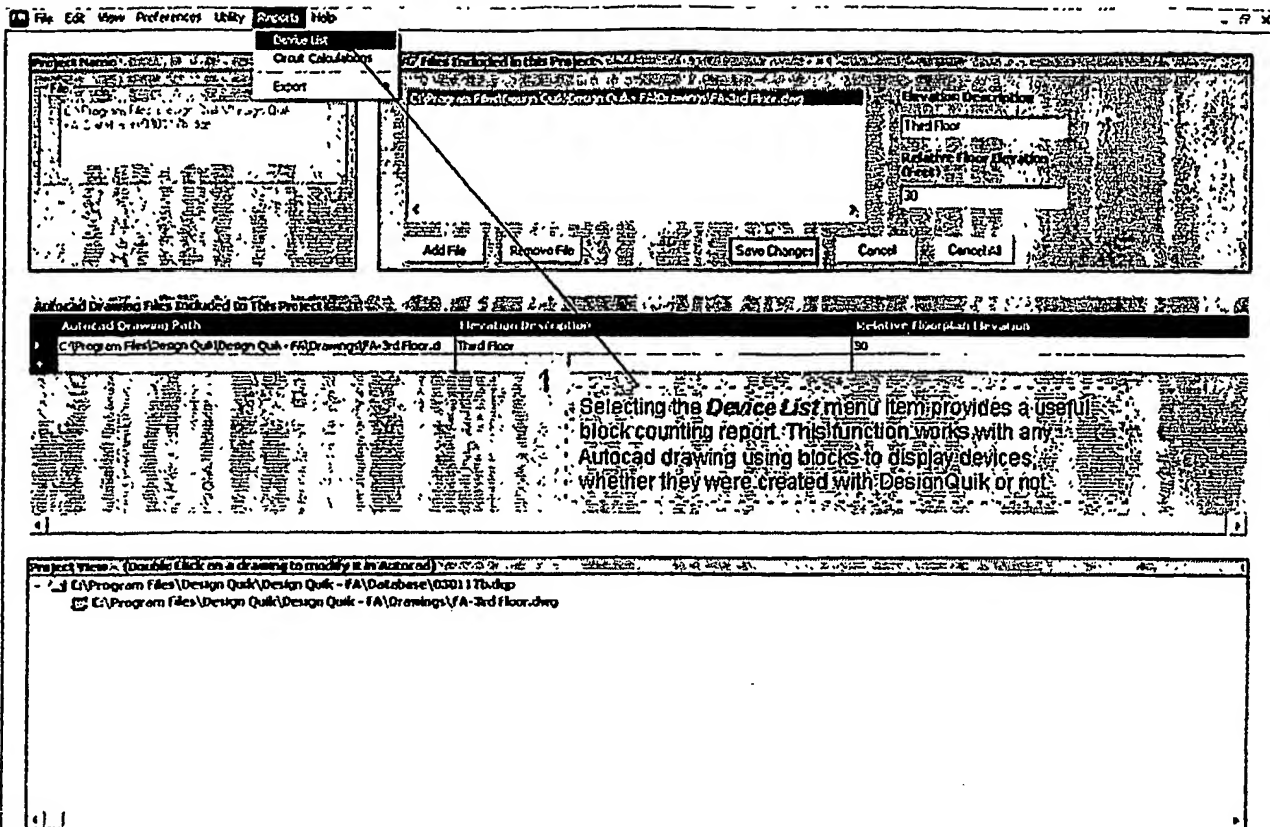


FIG. 20

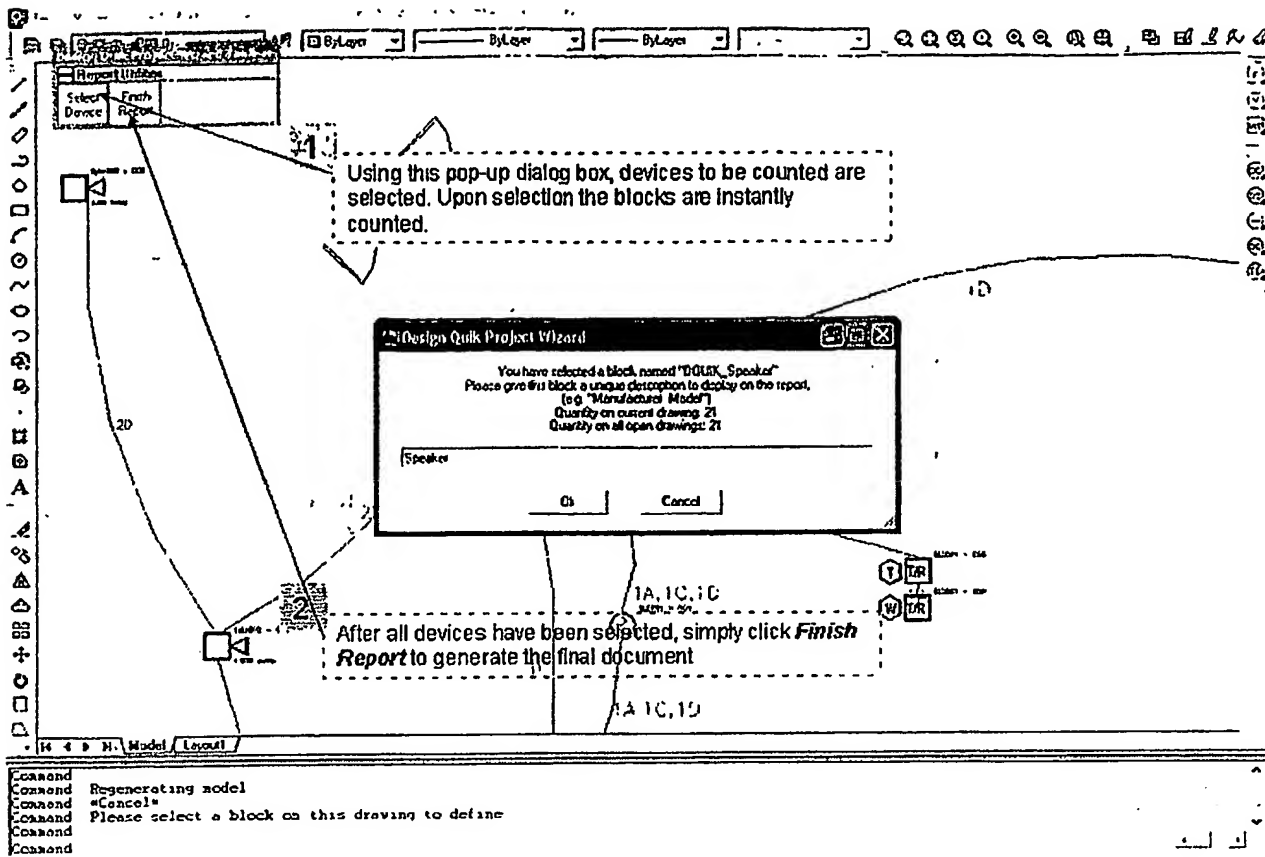


FIG. 21

Drawing Name					Block Name		Device Name		Quantity
1	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg	DOUK Speaker	Speaker	21					
2	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg	DOUK StrobeSeparateNAC	Strobe Only	3					
3	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg	DOUK SmokeDetectorAddressable	Addressable Smoke Detector	2					
4	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg	DOUK MonitorModule	Monitor Module	2					
5	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg	DOUK VaherTamperSwitch	Tamper Switch	1					
6	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg	DOUK WaterFlowSwitch	Waterflow Switch	1					
7	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg	DOUK PullStationAddr	Manual Pull Station	1					
8	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg	DOUK HeatDetectorAddressable	Heat Detector	1					
9	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg	DOUK SpeakerStrobe	Speaker Strobe	2					
10	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-3rd Floor.dwg								
11									
12	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-4th Floor.dwg	DOUK Speaker	Speaker	32					
13	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-4th Floor.dwg	DOUK StrobeSeparateNAC	Strobe Only	6					
14	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-4th Floor.dwg	DOUK SmokeDetectorAddressable	Addressable Smoke Detector	2					
15	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-4th Floor.dwg	DOUK MonitorModule	Monitor Module	6					
16	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-4th Floor.dwg	DOUK VaherTamperSwitch	Tamper Switch	3					
17	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-4th Floor.dwg	DOUK WaterFlowSwitch	Waterflow Switch	3					
18	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-4th Floor.dwg	DOUK PullStationAddr	Manual Pull Station	1					
19	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-4th Floor.dwg	DOUK HeatDetectorAddressable	Heat Detector	1					
20	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-4th Floor.dwg	DOUK SpeakerStrobe	Speaker Strobe	2					
21									
22	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-5th Floor.dwg	DOUK Speaker	Speaker	19					
23	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-5th Floor.dwg	DOUK StrobeSeparateNAC	Strobe Only	4					
24	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-5th Floor.dwg	DOUK SmokeDetectorAddressable	Addressable Smoke Detector	2					
25	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-5th Floor.dwg	DOUK MonitorModule	Monitor Module	4					
26	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-5th Floor.dwg	DOUK VaherTamperSwitch	Tamper Switch	2					
27	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-5th Floor.dwg	DOUK WaterFlowSwitch	Waterflow Switch	2					
28	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-5th Floor.dwg	DOUK PullStationAddr	Manual Pull Station	1					
29	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-5th Floor.dwg	DOUK HeatDetectorAddressable	Heat Detector	1					
30	C:\Program Files\Design Quik\Design Quik - FA\Drawings\FA-5th Floor.dwg	DOUK SpeakerStrobe	Speaker Strobe	2					
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									
A report of all devices by project drawing and with a totalizing section is the result.					Summary Report of Device Counts				
					Speaker		72		
					Strobe Only		13		
					Addressable Smoke Detector		6		
					Monitor Module		12		
					Tamper Switch		6		
					Waterflow Switch		6		
					Manual Pull Station		3		
					Heat Detector		3		
					Speaker Strobe		6		

FIG. 22

DesignQuik FA ...

**Provides *DesignQuik Data Manager*
to insure accuracy.**

FIG. 23

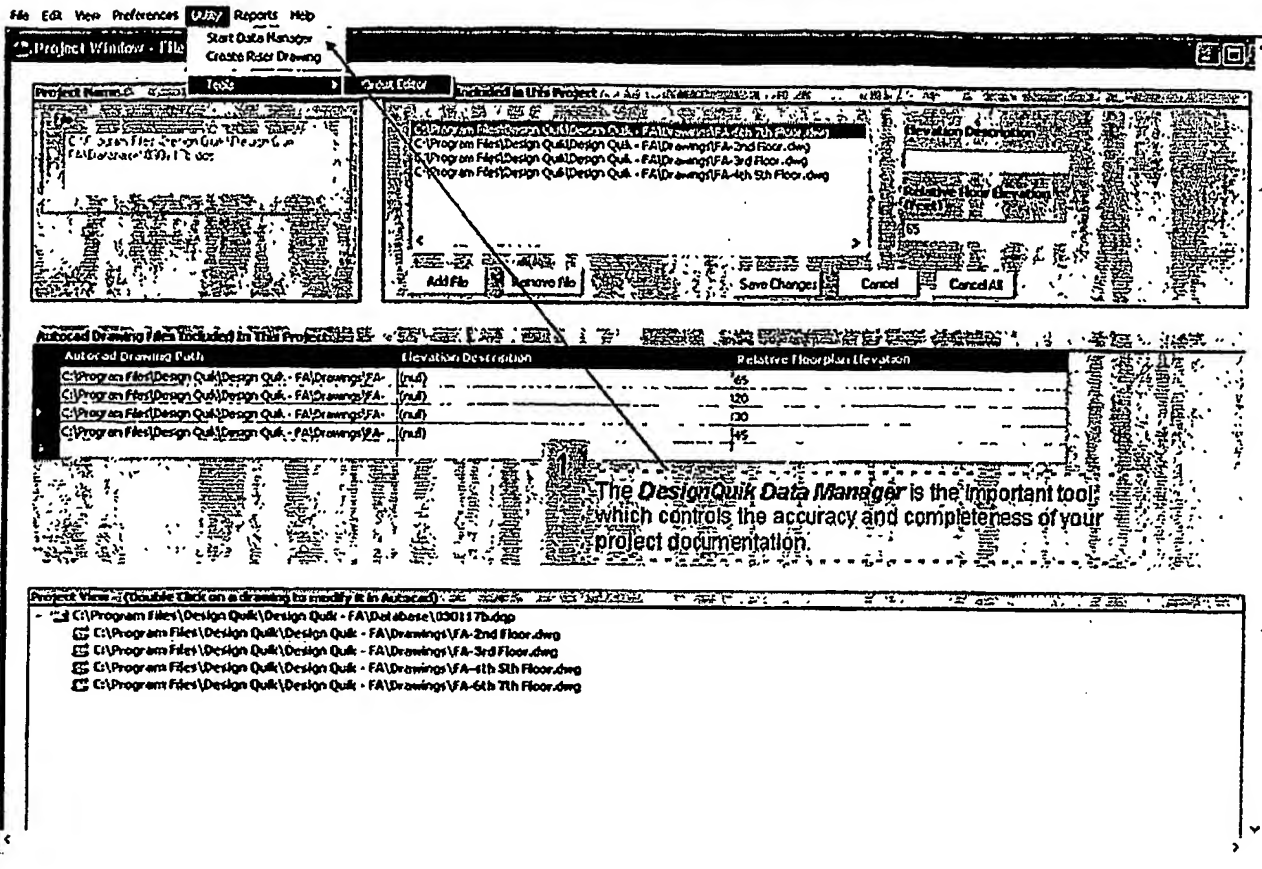


FIG. 24

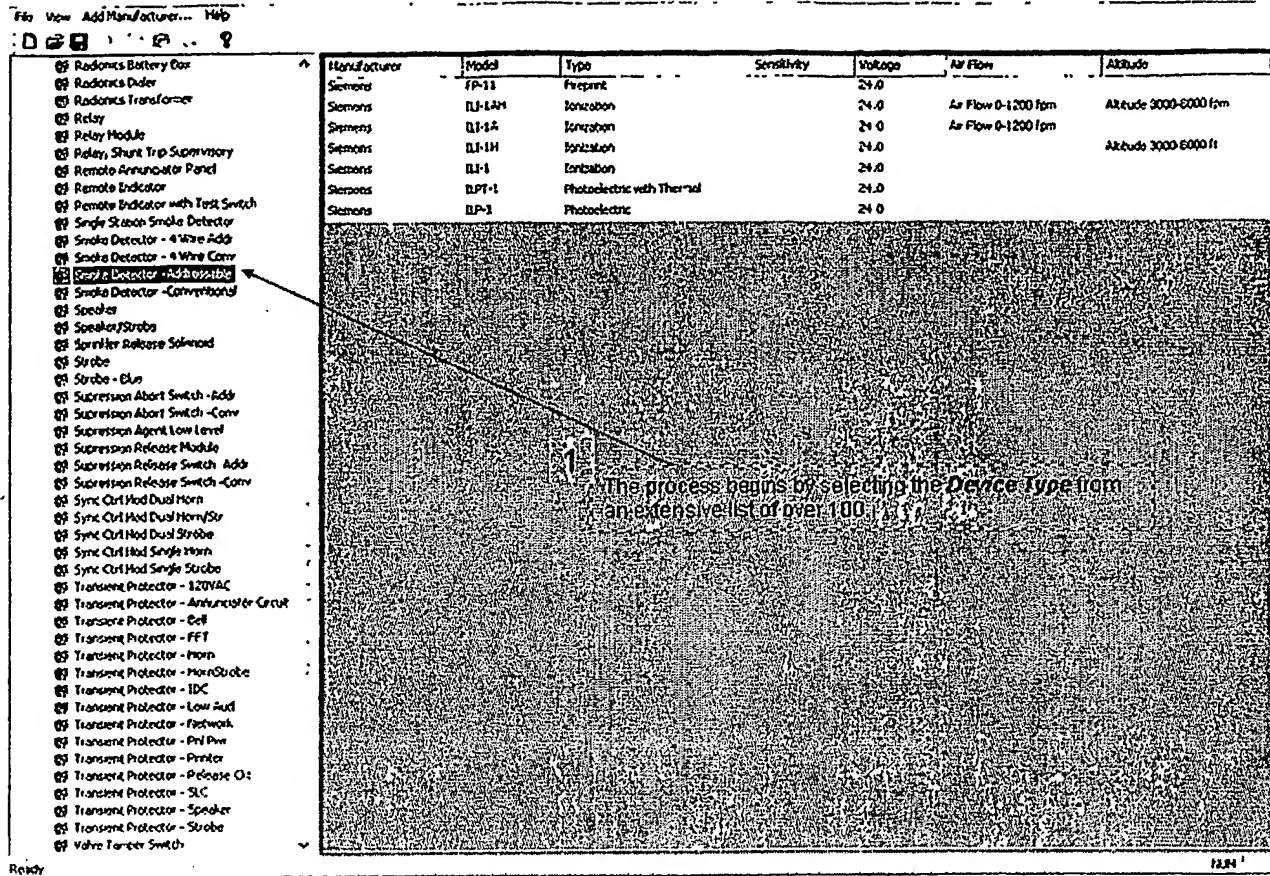


FIG. 25

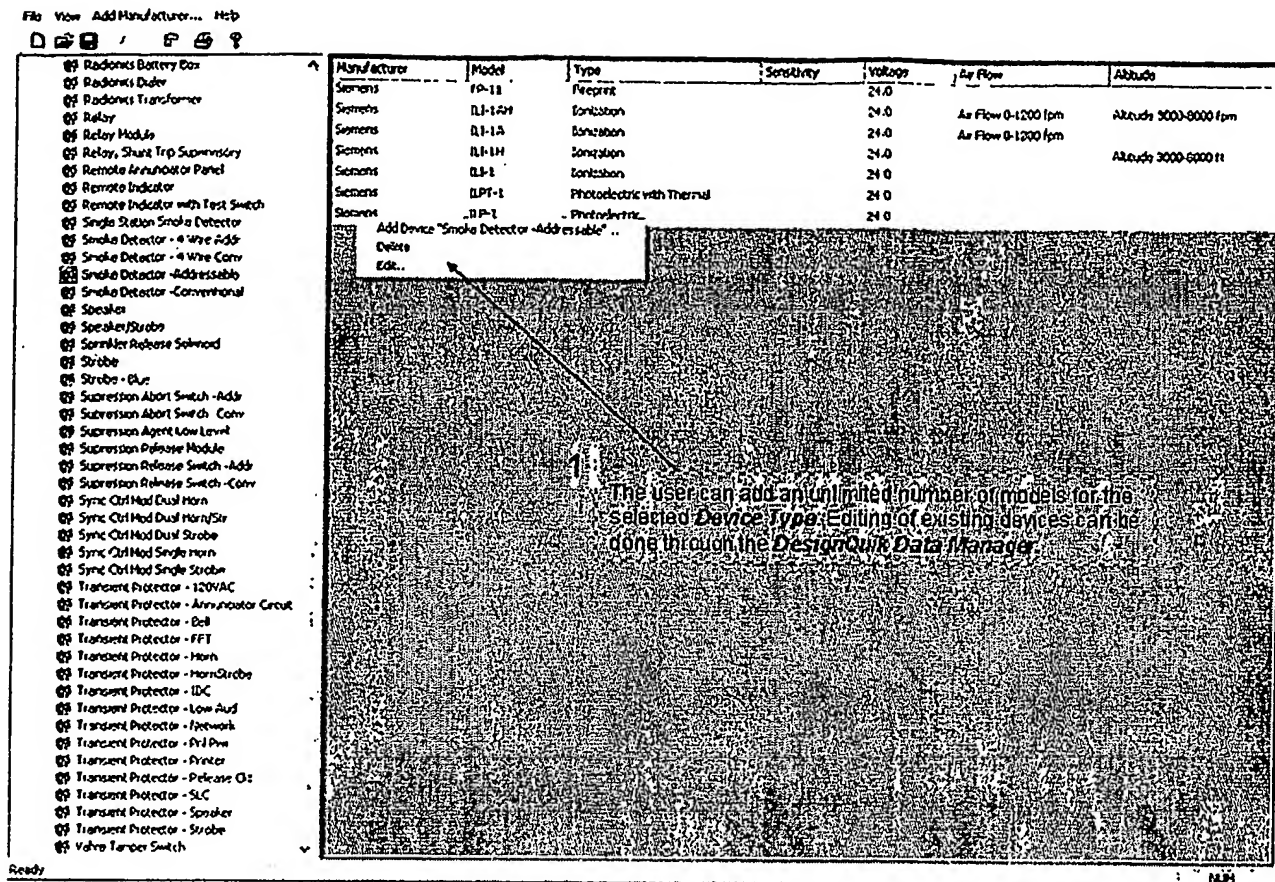


FIG. 26

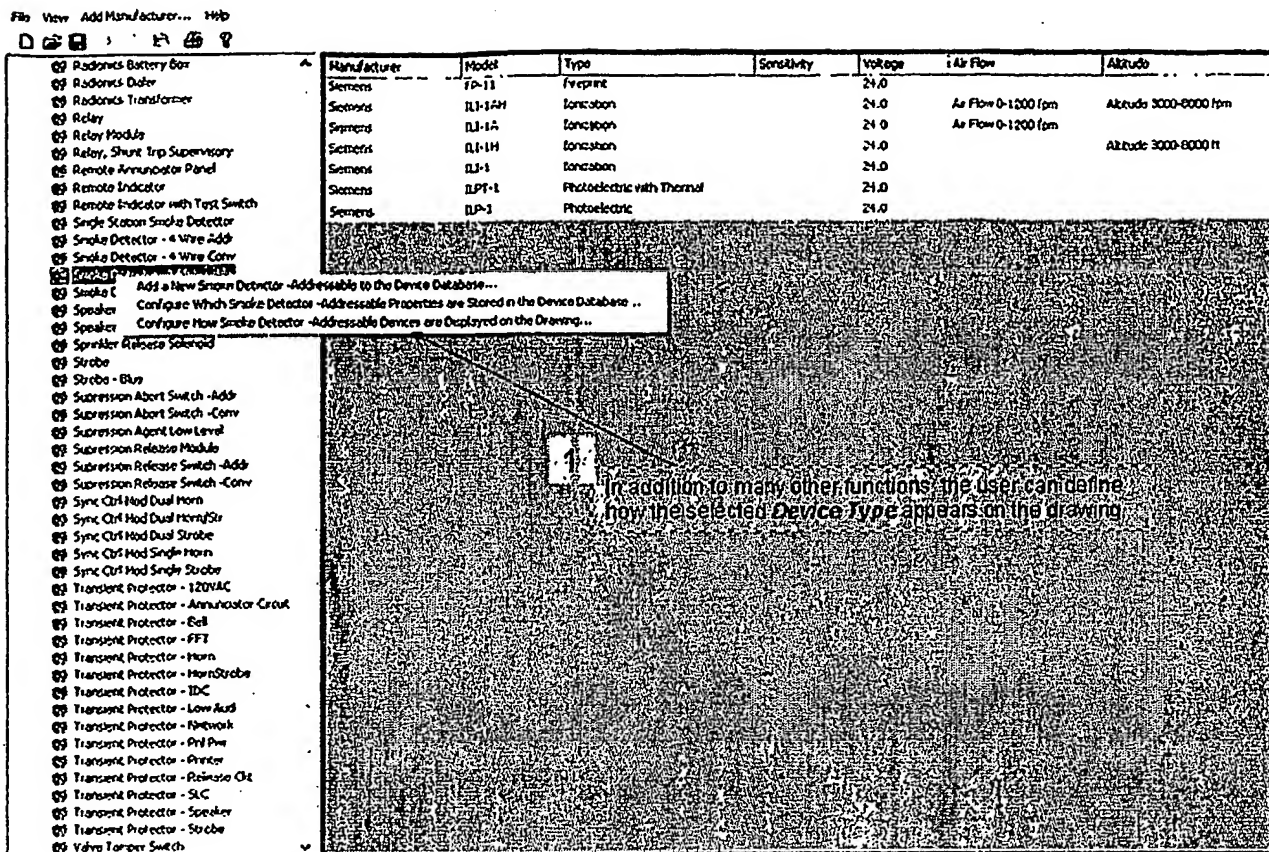


FIG. 27

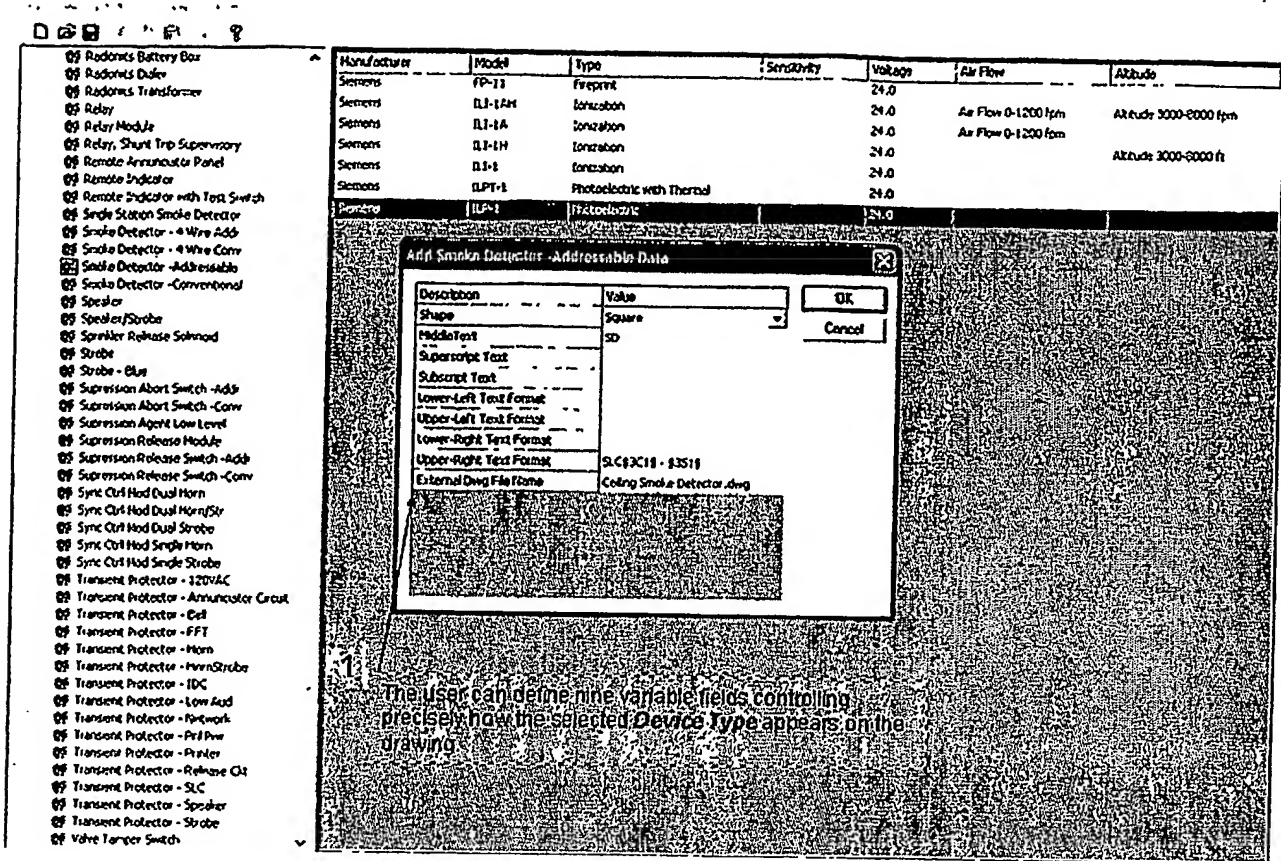


FIG. 28

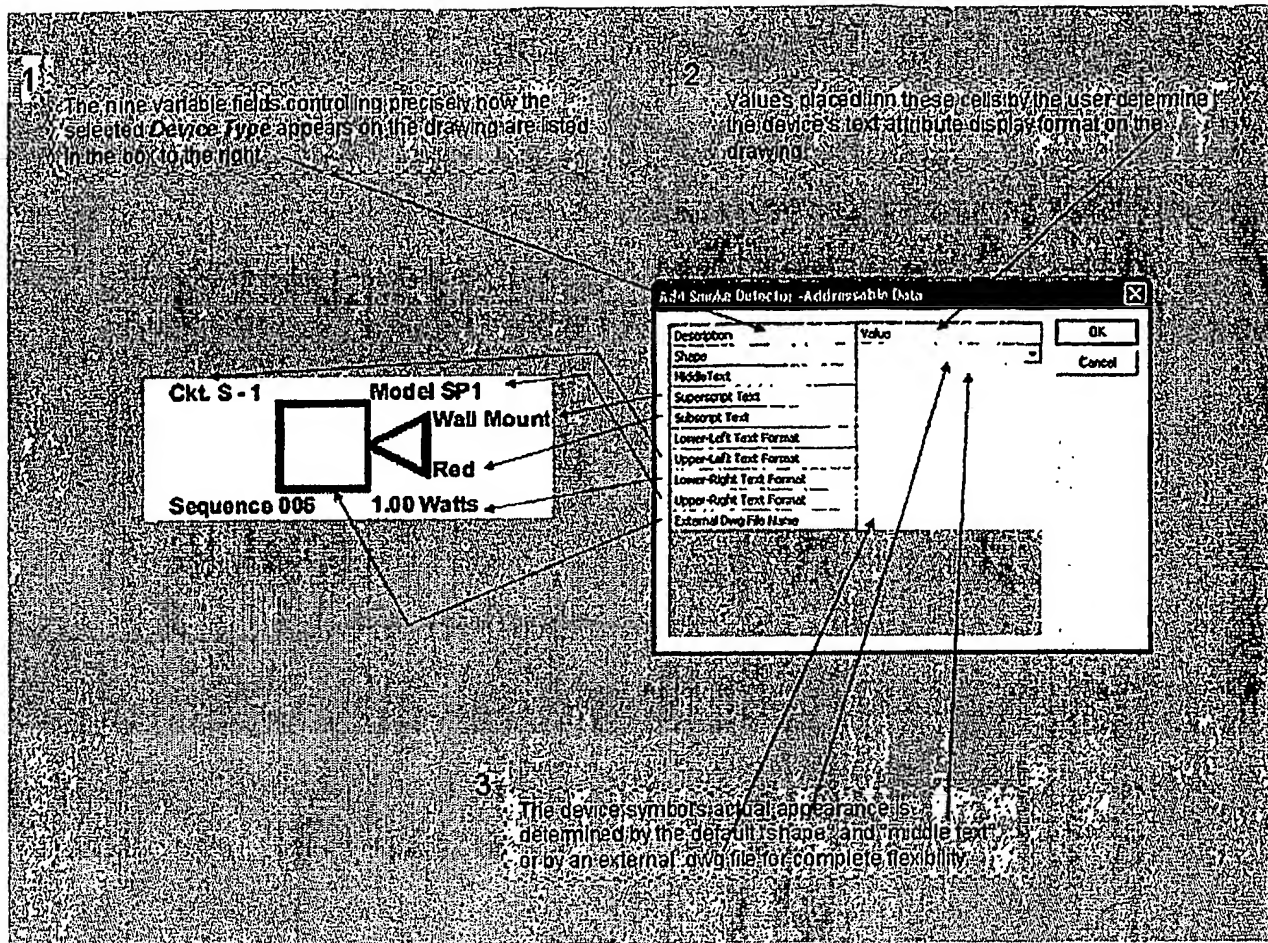


FIG. 29

DesignQuik FA...

Organizes Your Project Files

• **Partially *Draws AutoCAD Drawings for you***

• **Actually *Draws AutoCAD Drawings for you***

• **Creates Sophisticated *Reports for you***

• **Provides *Utilities for your existing drawings***

• **Provides *DesignQuik Data Manager to insure accuracy***

FIG. 30

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

Introduction

DesignQuik[®]-FA is a tool that links fire alarm system design with document preparation. It assists the user with speedy preparation of fire alarm system floor plans using AutoCAD version 2002 or higher.

DesignQuik[®] uses the information from the floor plans to generate other critical submittal documents such as riser diagrams, voltage drop calculations, and system bills of material.

The following easy steps are used to develop complete system documentation:

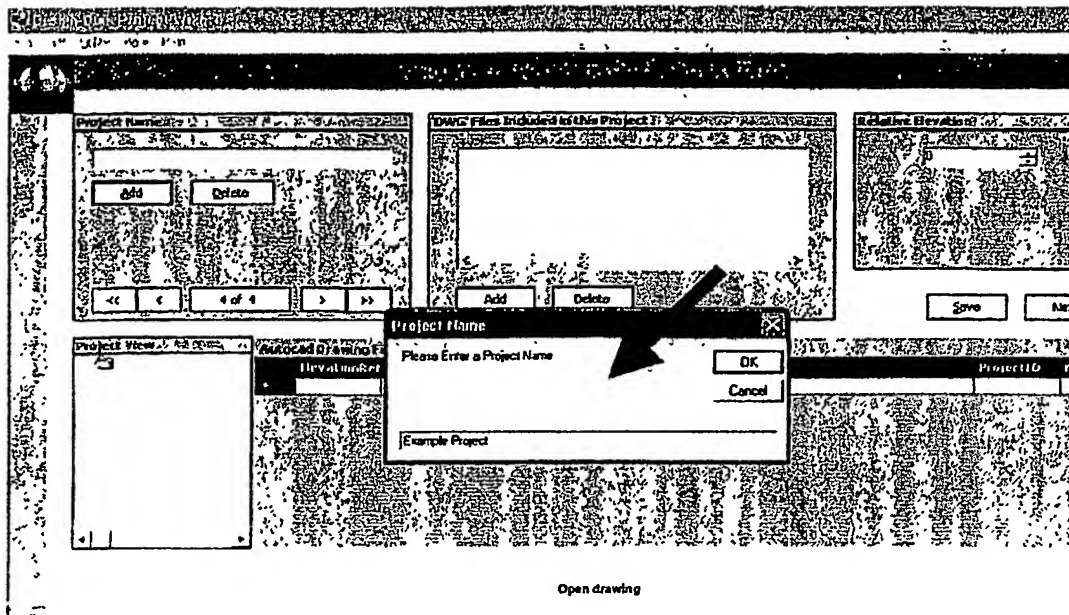
1. Start DesignQuik[®] software
2. Define the project
 - 2.1. Project name
 - 2.2. List project floor plan files (.dwg files) and set relative elevations
3. Prepare floor plans using AutoCAD
 - 3.1. Select fire alarm devices from a user-defined database
 - 3.2. Place devices on the floor plan.
 - 3.3. Connect devices by simple mouse click.
4. Request documents by mouse click
 - 4.1. Floor plans
 - 4.2. Riser diagram
 - 4.3. Panel diagram
 - 4.4. Voltage and decibel drop calculations
 - 4.5. Equipment list/bill of material

Detailed instruction follow this page. Go to [Next Page](#)

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

The "Project Name" dialog box will be displayed. Type the project name and click OK.



The screen display will now look like the figure below. Now add a floor plan drawing to the project drawing list by clicking on the "Add" button.

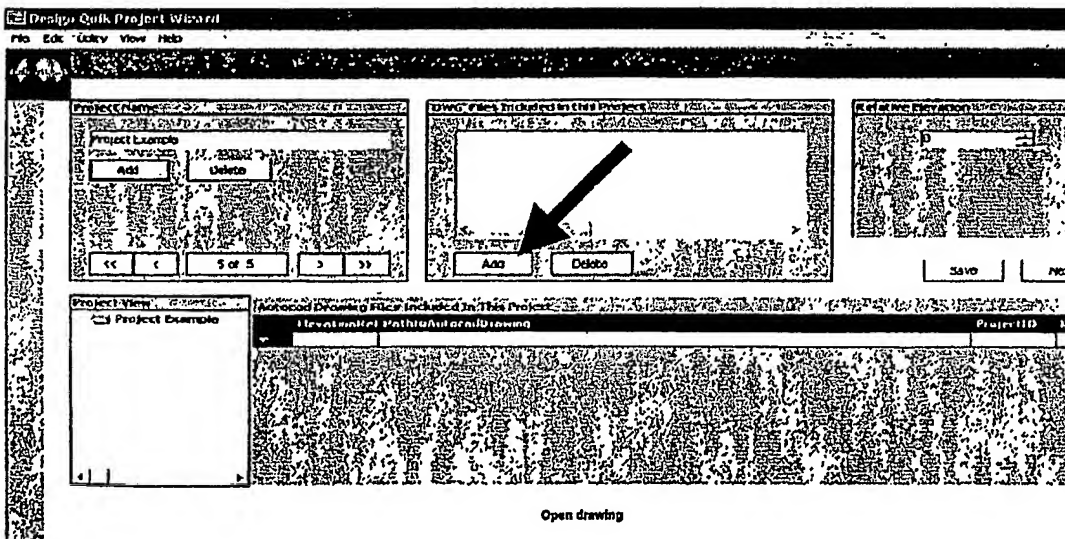
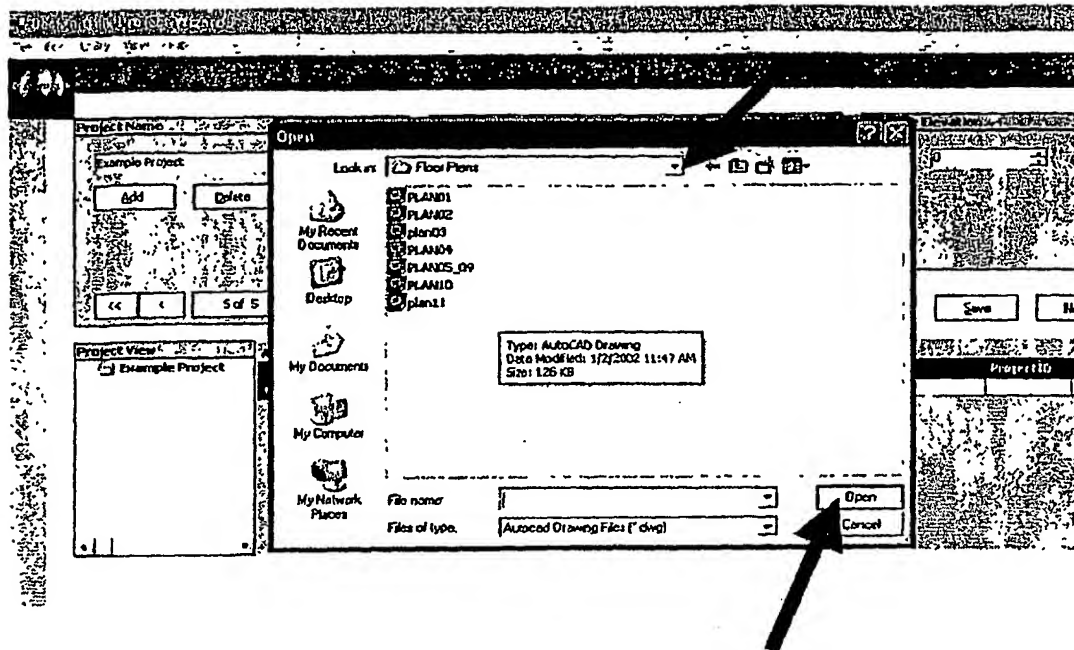
[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

FIG. 32

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

The screen will show the following display. From this screen, it is possible to browse your files and select a drawing to add to the project list. To browse, use the pull down arrow shown below.



Click on the drawing you wish to add to the list, then click the "Open" button. The following screen will be displayed, with the drawing added to the project list.

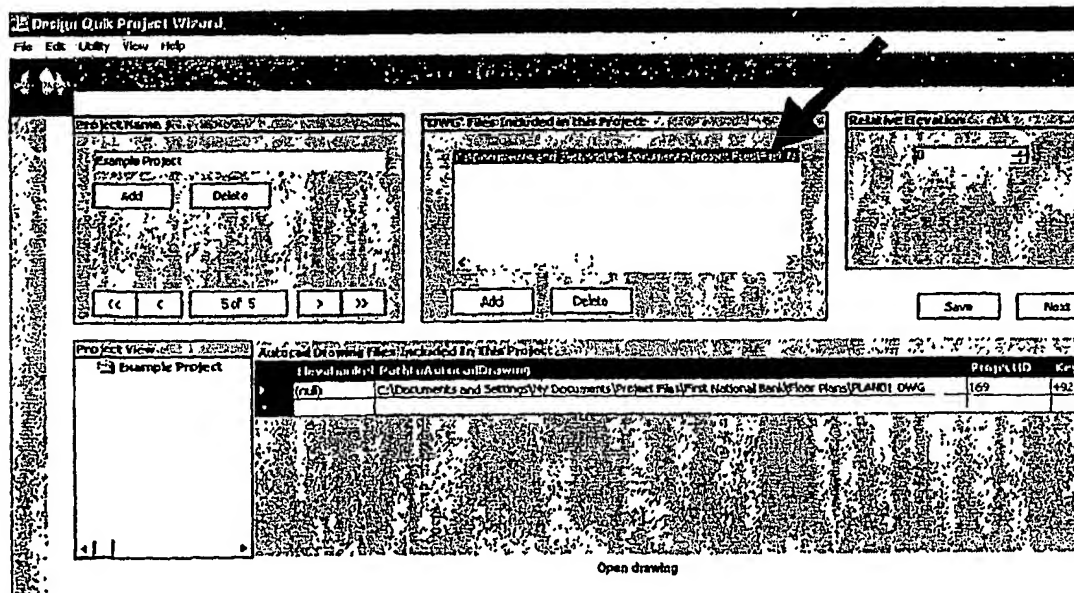
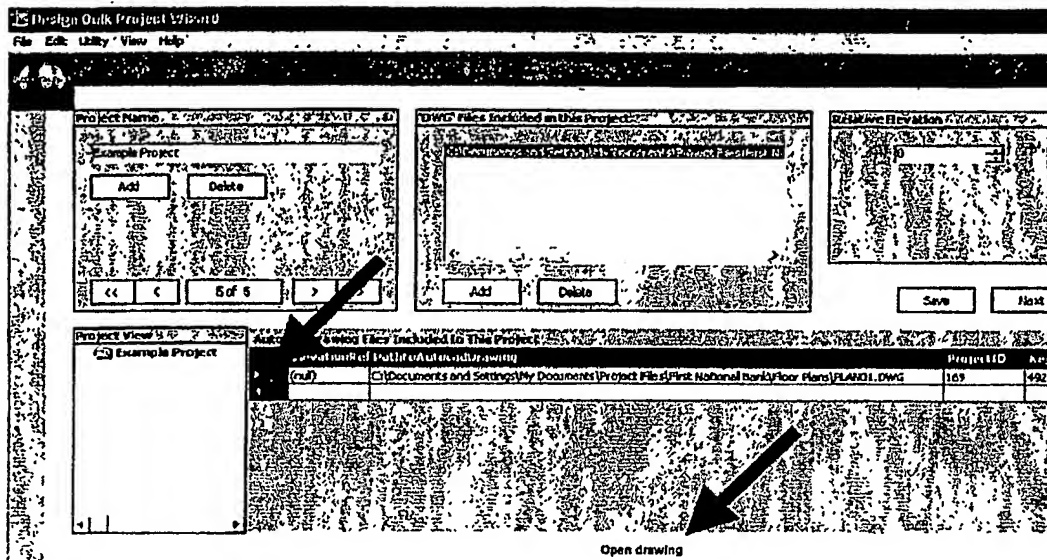


FIG. 33

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

1. Prepare floor plans using AutoCAD

In order to begin working on a floor plan, open the drawing by selecting it from the drawing list and clicking on the "Open Drawing" button.



AutoCAD will automatically start and the drawing will be opened. In addition to the regular menu items, a "DesignQuik" menu item will be present at the top of the screen.

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

FIG. 34

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

DesignQuik[®] will automatically start AutoCAD and open the drawing. Notice that there is a special menu item for DesignQuik[®] functions.

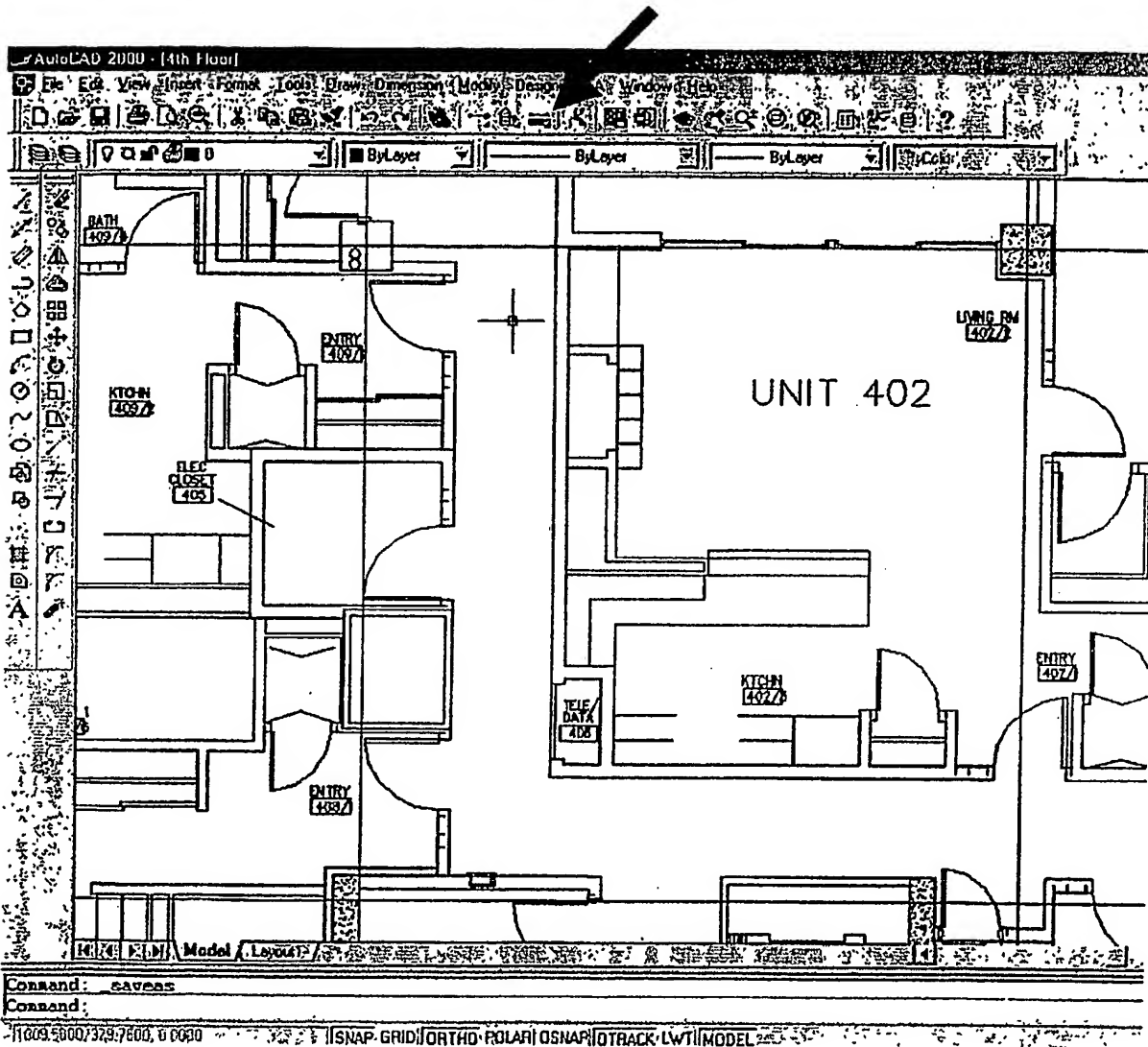
[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

FIG. 35

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

The **DesignQuik**® Project Wizard will automatically start AutoCAD and open the drawing. Notice that there is a special menu item for **DesignQuik**® functions, and toolbars with slide out buttons docked on the right and floating in the model space.

**FIG. 36A**

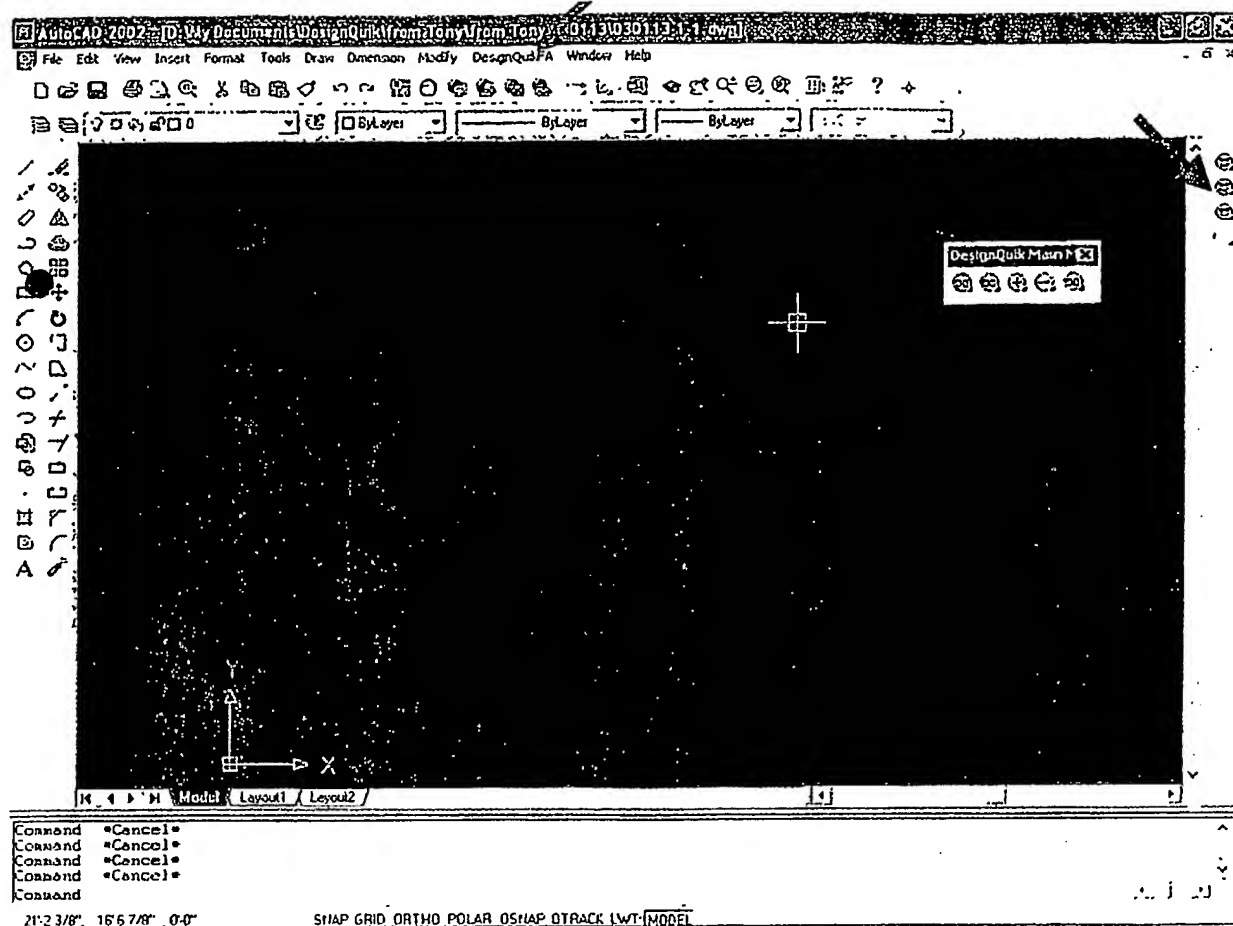


FIG. 36B

[Previous Page]

[Next Page]

[Return To Beginning]

The floating toolbar can be dragged and docked. Each toolbar button represents a DesignQuik command. Each toolbar button on the side toolbar represents a fire alarm device from the Project Device List.

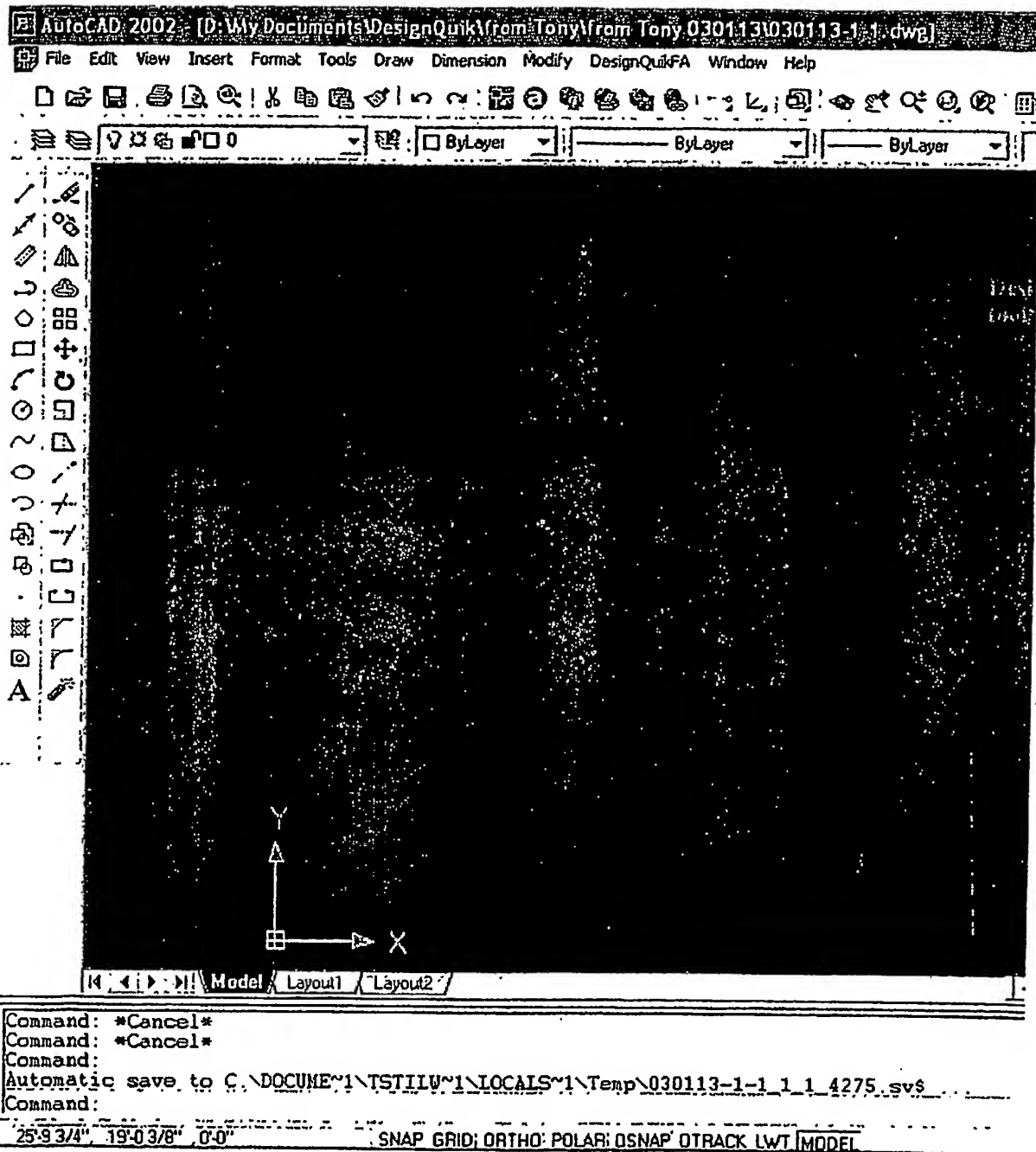


FIG. 37A

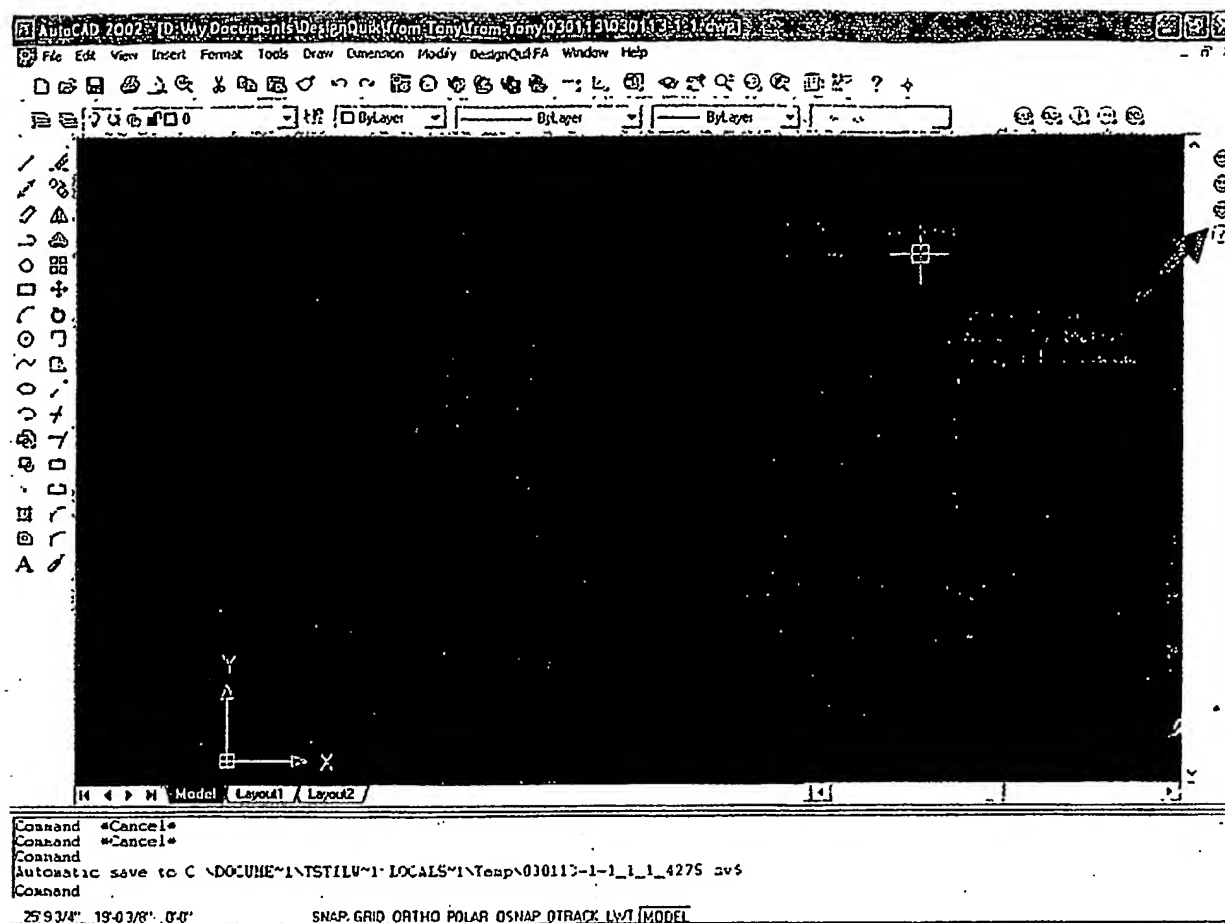


FIG. 37B

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

To get started placing the fire alarm system on the floor plan, click on the **DesignQuik®** menu and select "Device Placement". A submenu will present the devices from the Project Device List for selection and placement. Alternatively, you may select from the toolbars on the right. (see next slide)

FIG. 38

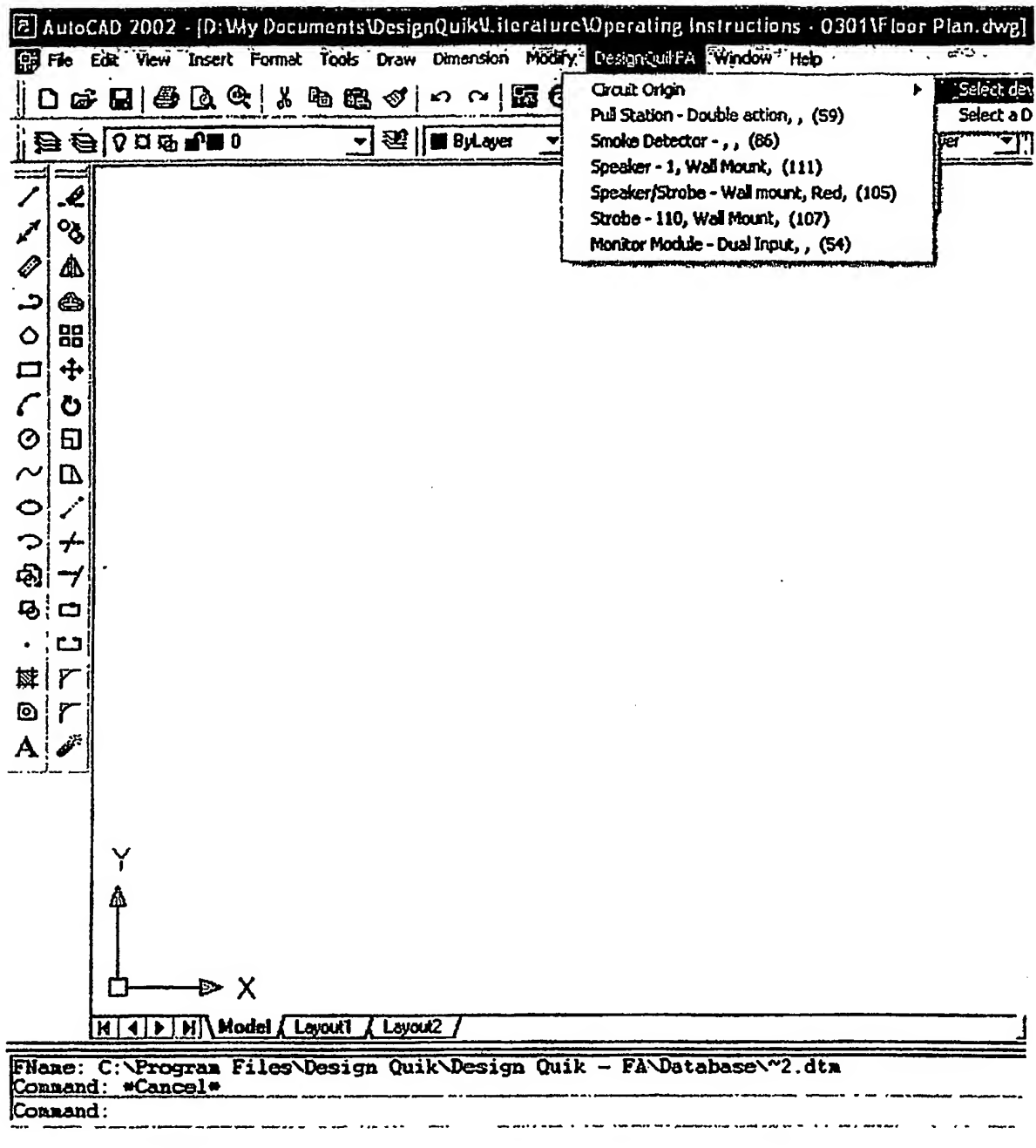
[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

FIG. 39A

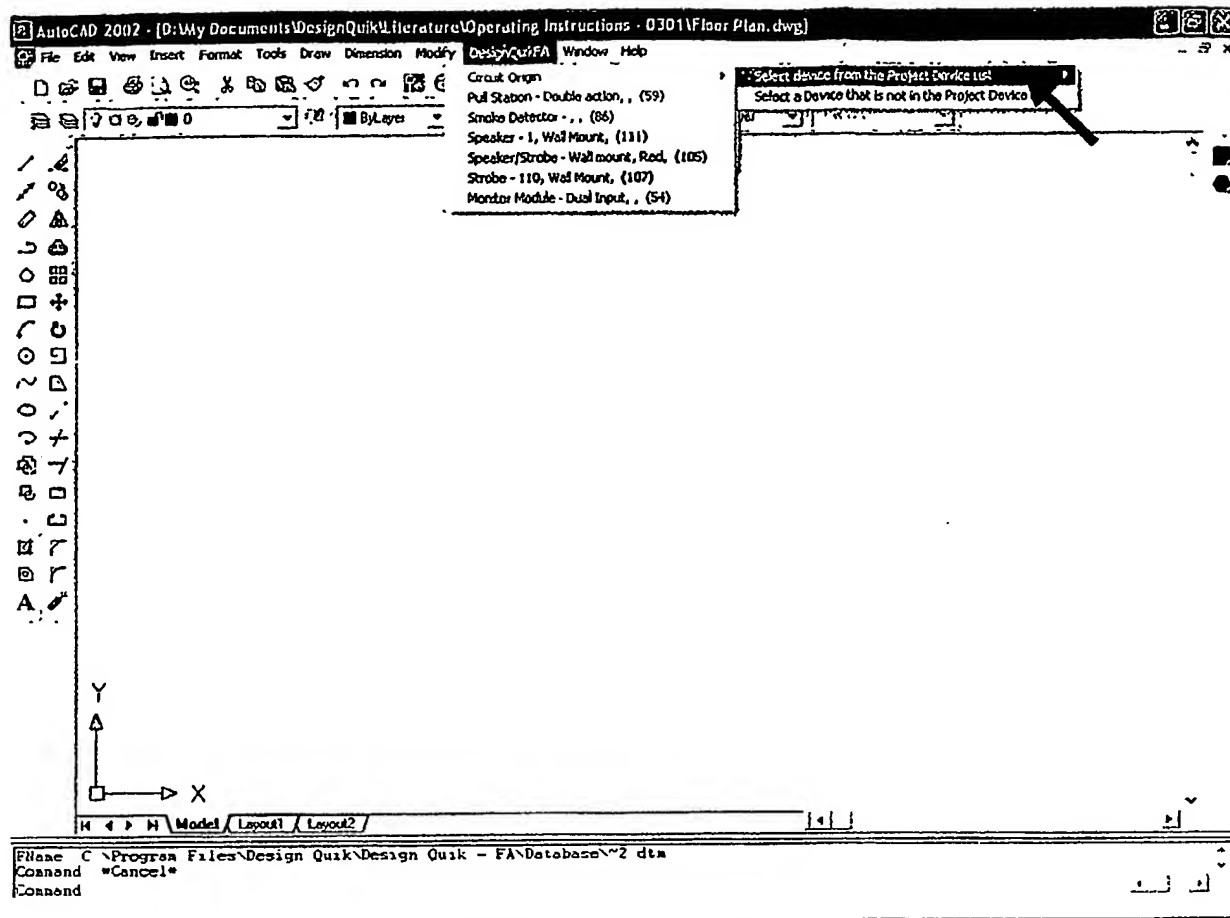


FIG. 39B

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

The toolbars offer a quick, easy alternative to using the menu for selecting and placing items. Hold the mouse cursor over the toolbar and hold down the left mouse button to view the "slide out" toolbar buttons. While continuing to hold down the left mouse button, slide the mouse cursor over the individual toolbar buttons to view the specific devices for selection. Note that the tooltip text displays the device and certain useful characteristics for quick, accurate selection.

FIG. 40

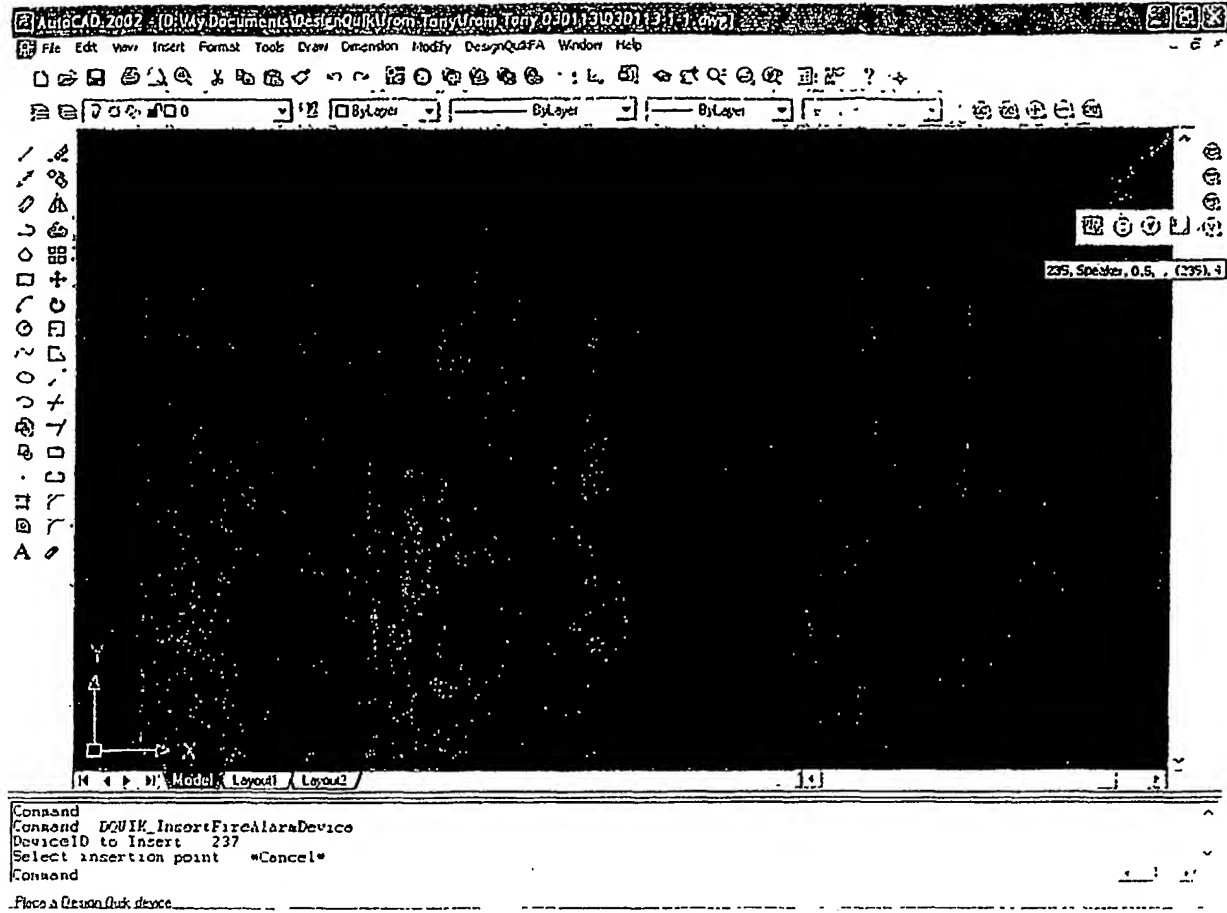


FIG. 41

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

Select the first device, as prompted in the Command line. Connect devices must begin with a Circuit Origin or a previously connected device.

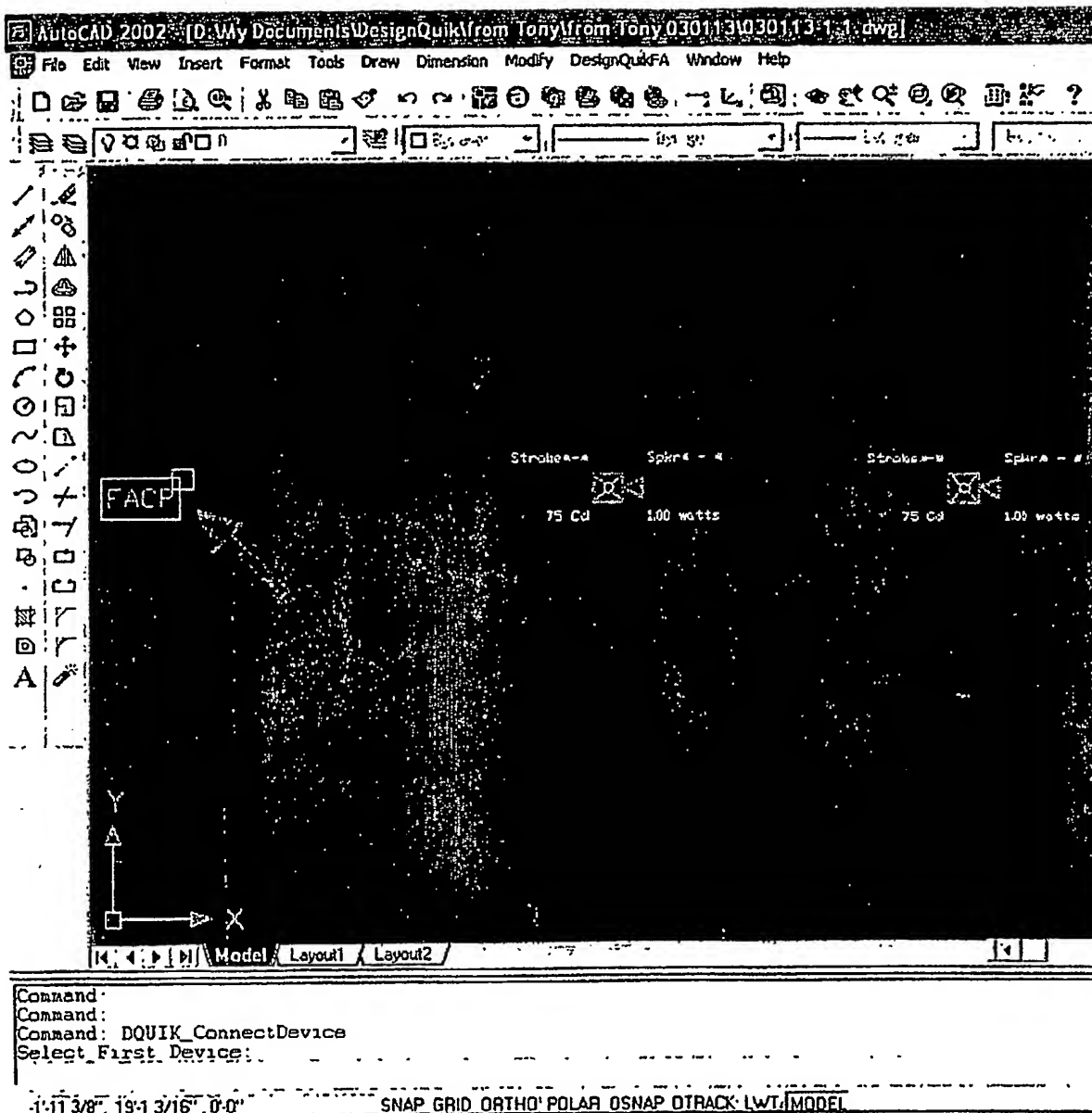
[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

FIG. 42A

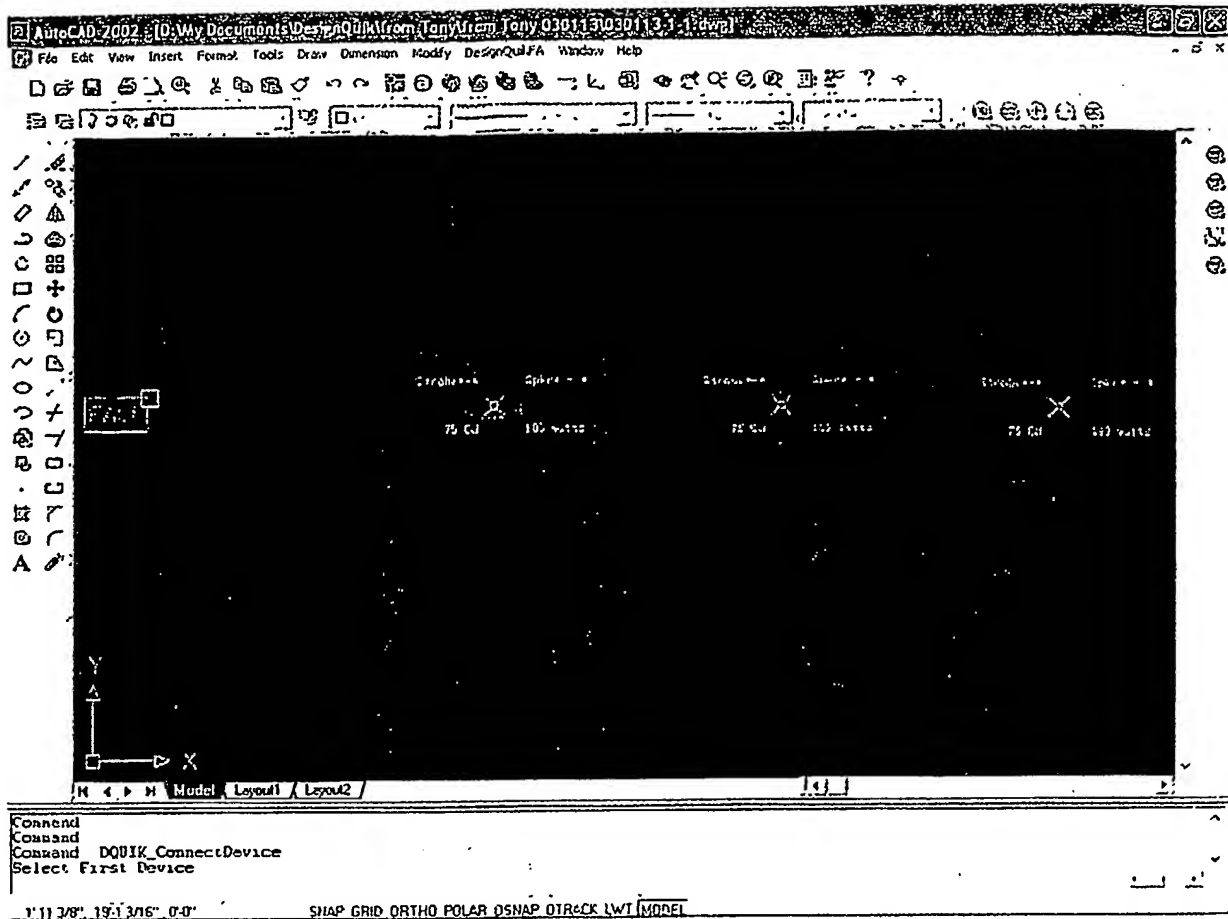


FIG. 42B

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

A dialog box will appear to offer options for circuit shape. Since the first device is a speaker strobe, the software will automatically choose speaker and strobe circuits for connection to the device. Click OK to select a Curve shape wireway.

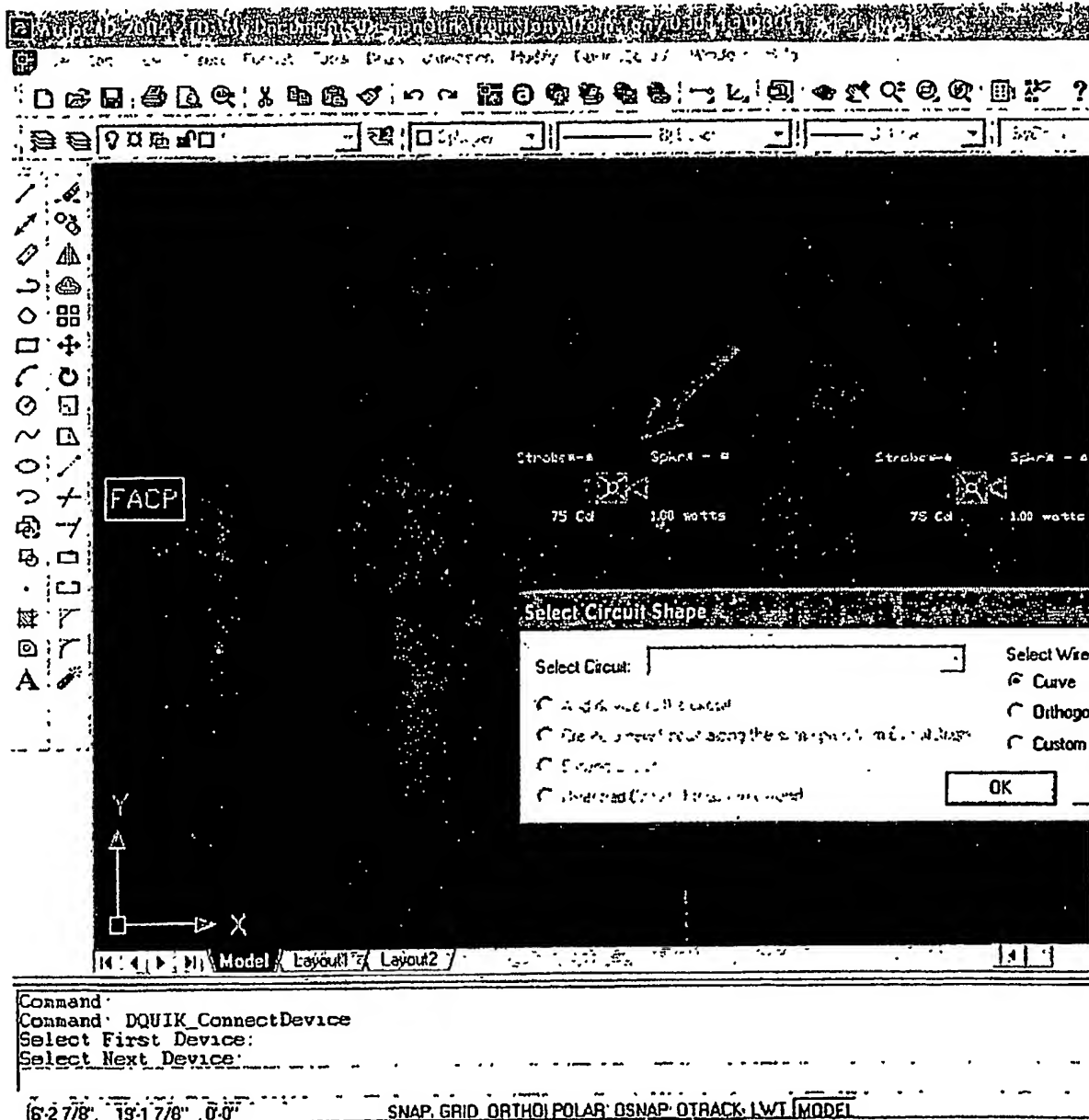


FIG. 43A

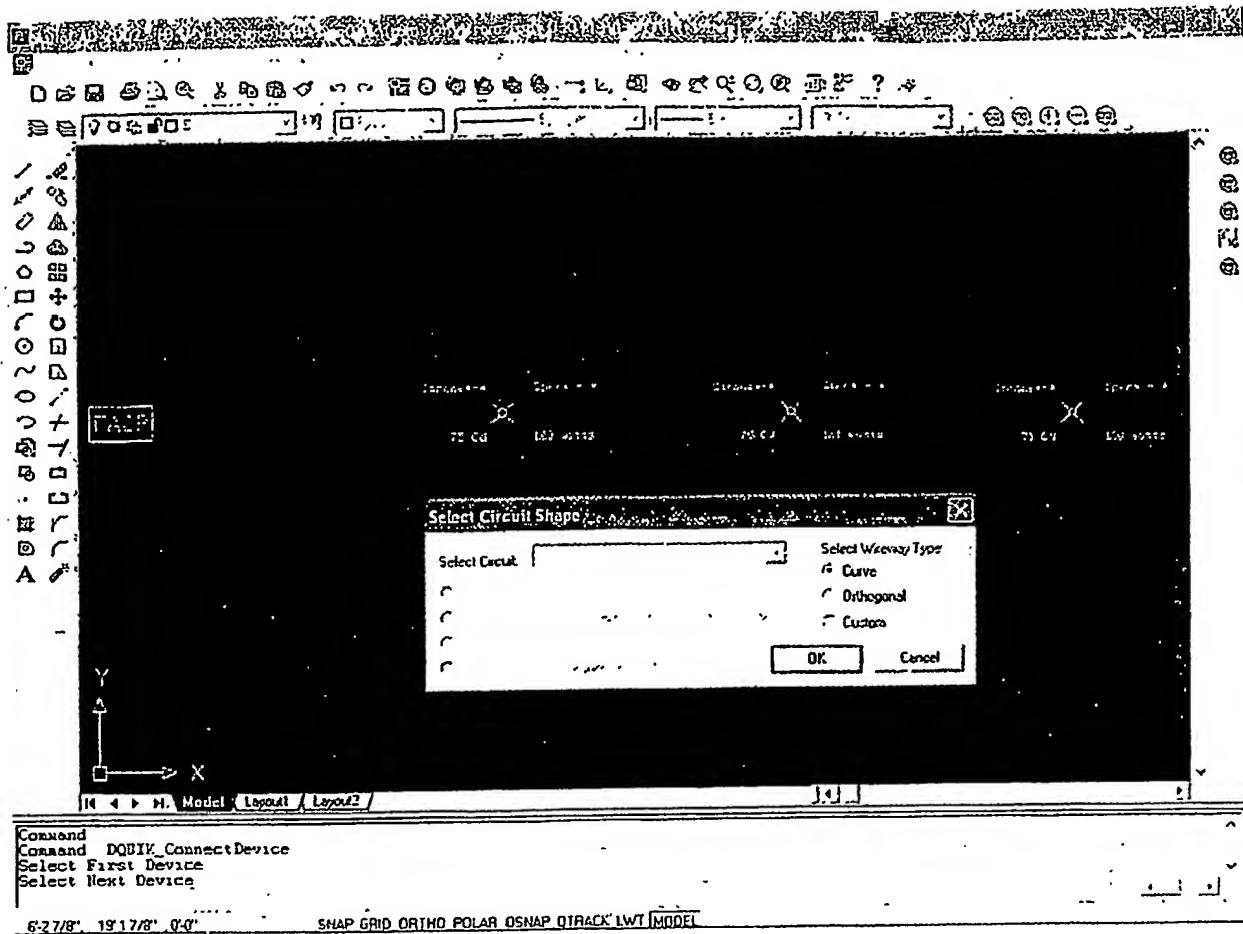
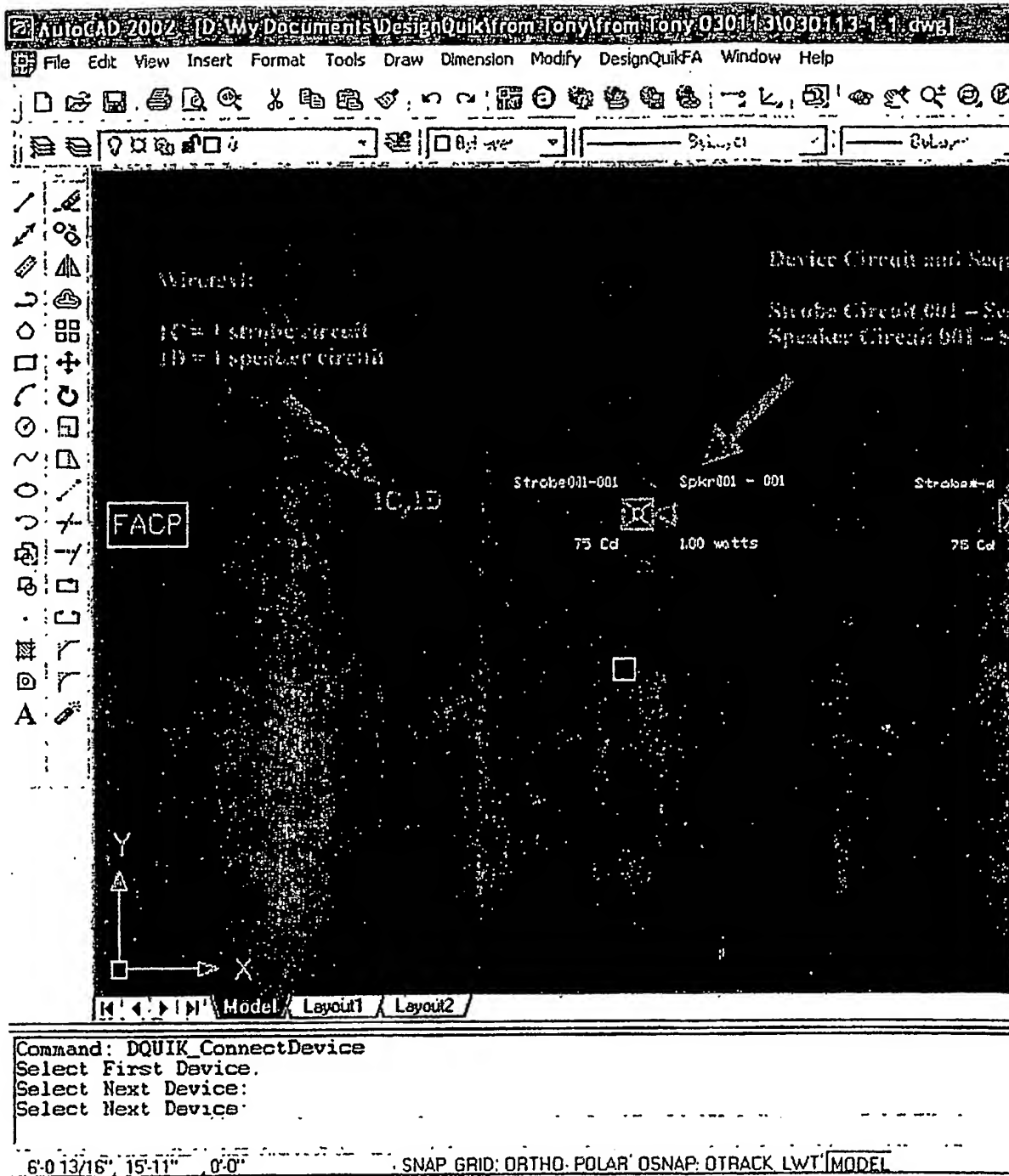


FIG. 43B

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

A curve wireway connects the FACP to the first device. The Wiretext displays the circuits in the wireway. The device circuit and sequence numbers are displayed, for the strobe and the speaker. The speaker wattage and the strobe candela output are also displayed. In the command line, the user is prompted to select the next device for connection.

FIG. 44



[Previous Page]

[Next Page]

[Return To Beginning]

FIG. 45A

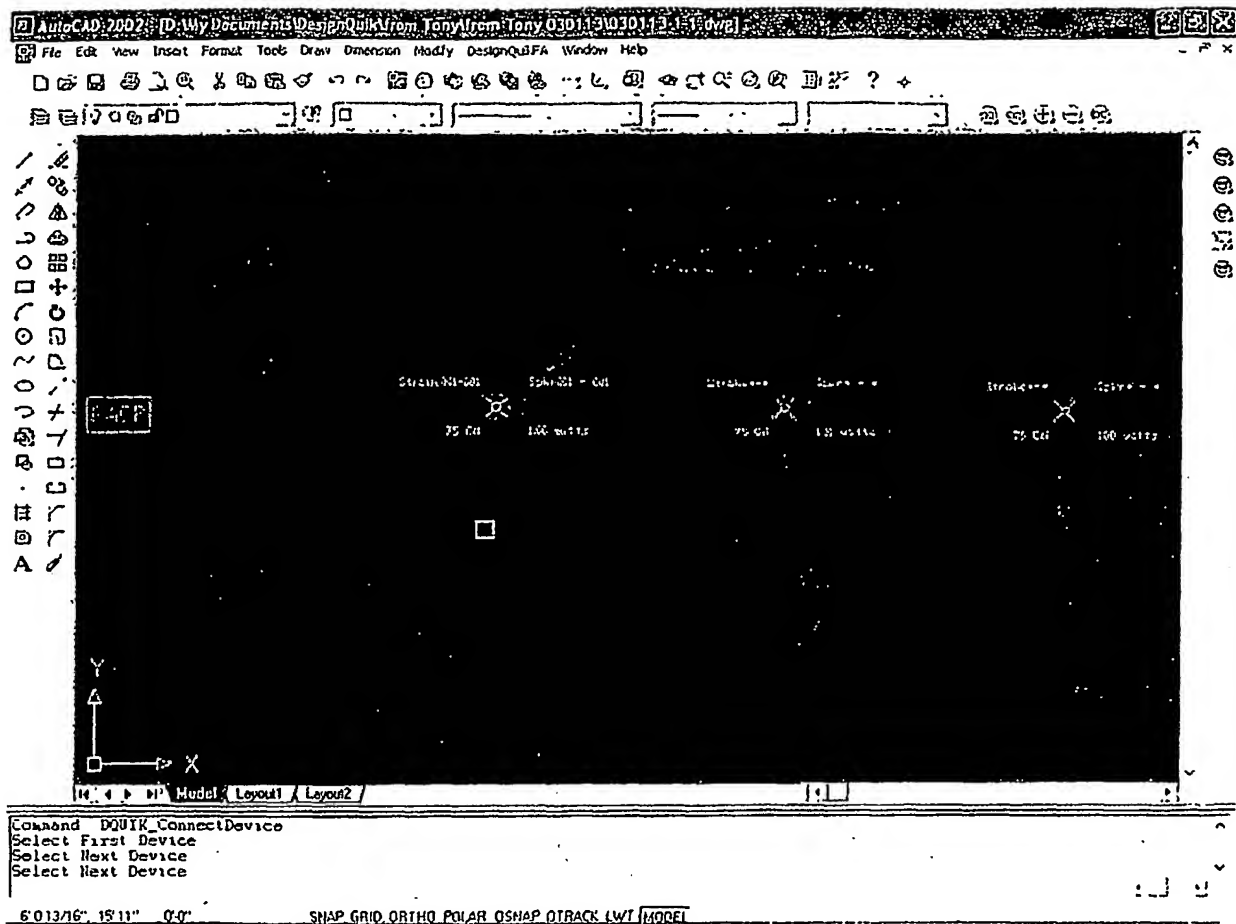
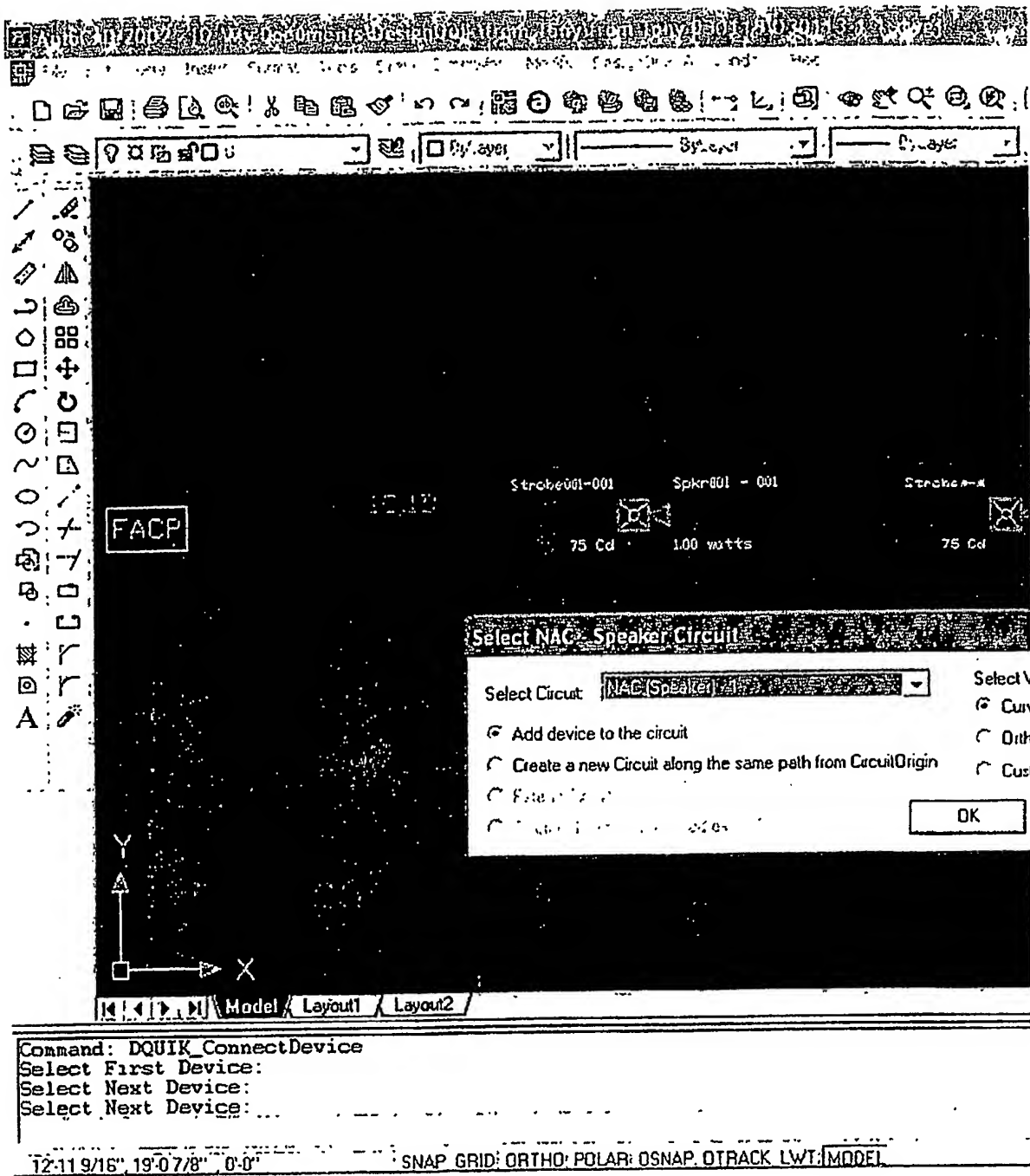


FIG. 45B

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

When the second device is selected for connection, the dialog box appears again. By selection of the proper radio button, the user is allowed to either connect the next speaker to the same circuit, or to "pull" a new circuit from the FACP (Circuit Origin) to the second device. For this example, choose "Add device to the circuit". Also, a curve wireway shape will be selected.

FIG. 46



[Previous Page]

[Next Page]

[Return To Beginning]

FIG. 47A

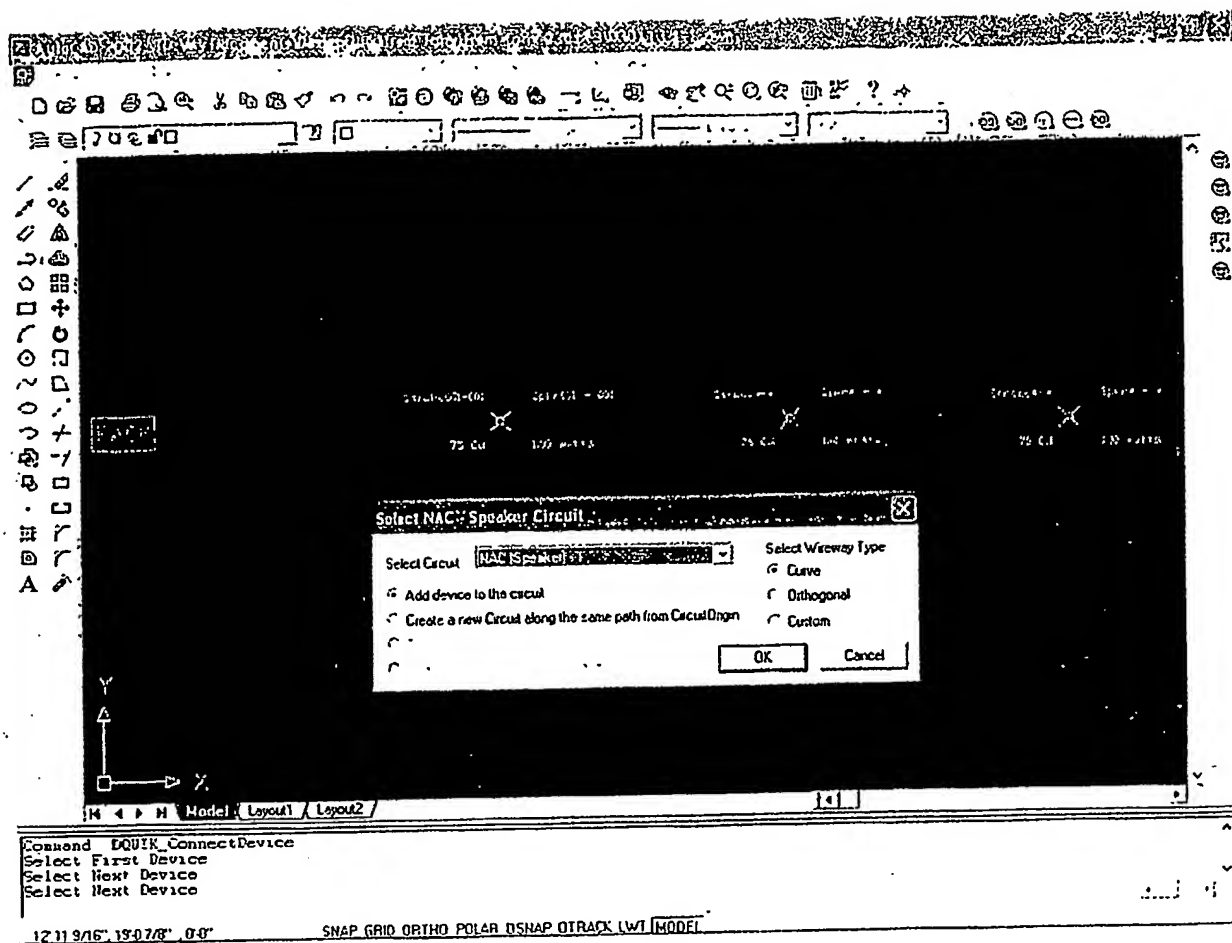


FIG. 47B

[Previous Page]

[Next Page]

[Return To Beginning]

Once the speaker circuit is selected, another dialog box is used to select the connection of the strobe. If OK is clicked now, a new strobe circuit will be created through the same wireway as Speaker Circuit 001.

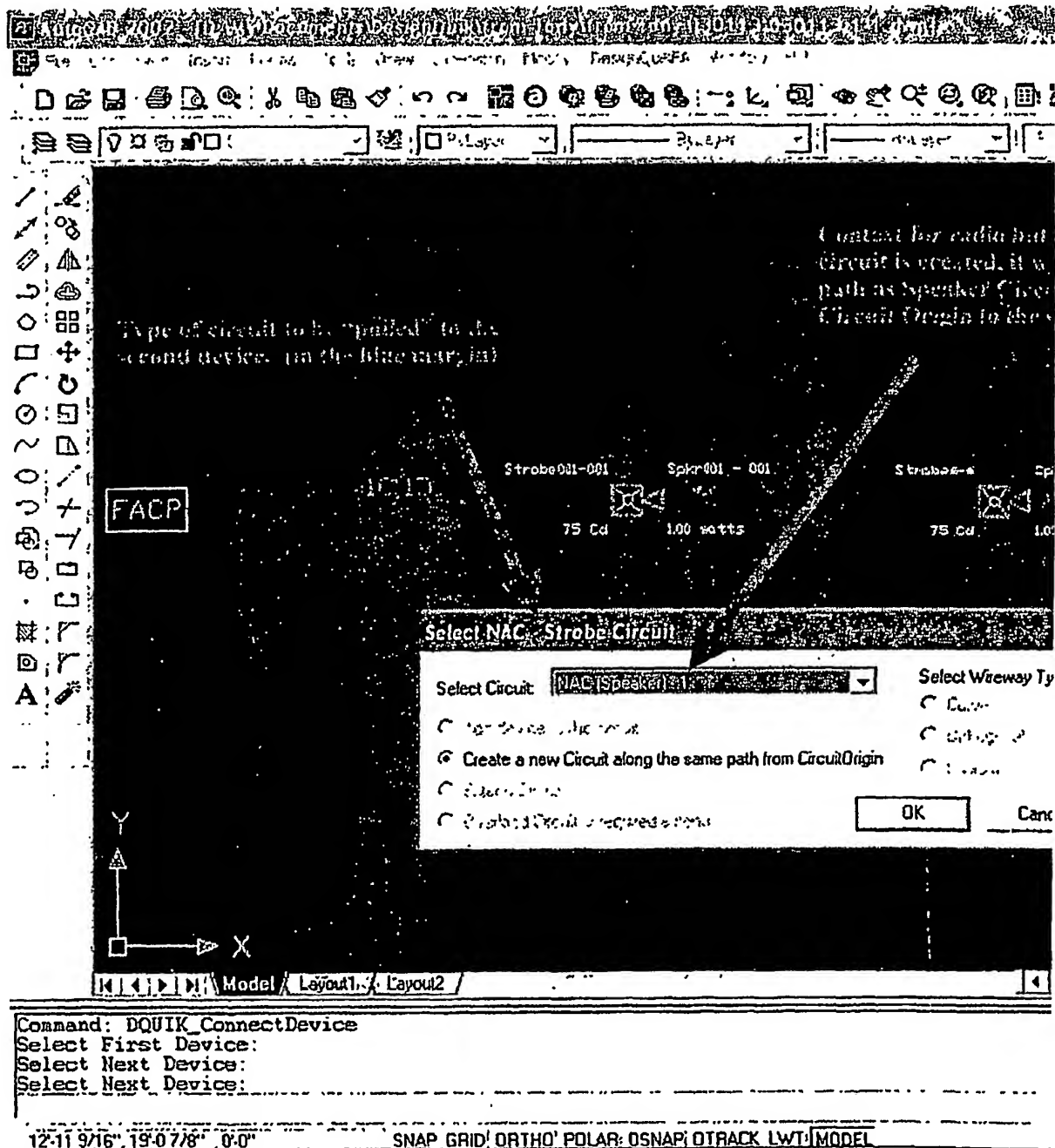


FIG. 48A

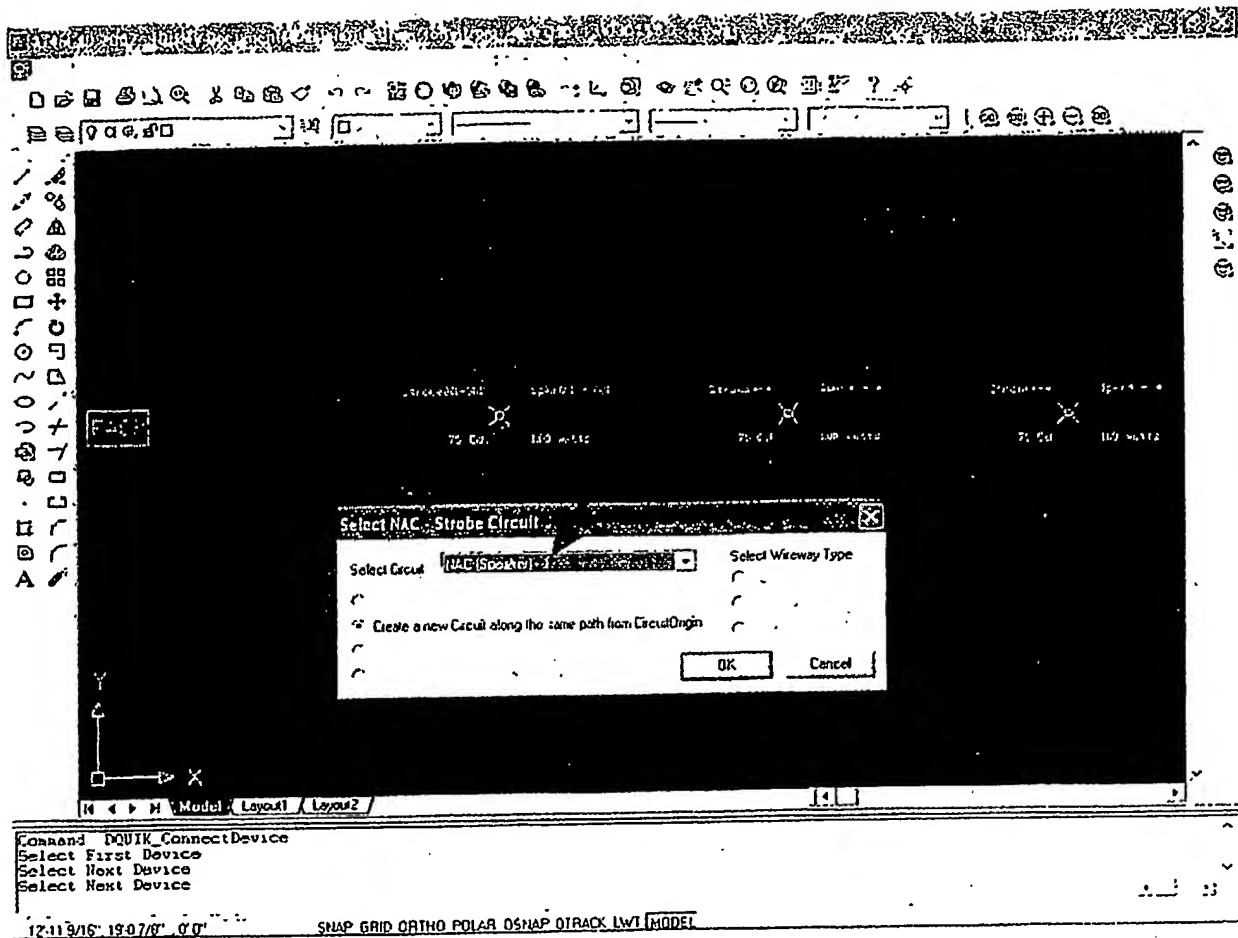


FIG. 48B

[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

Now change the context for the radio buttons, to see other options. Use the pull-down text box and select Strobe Circuit 1 as shown.

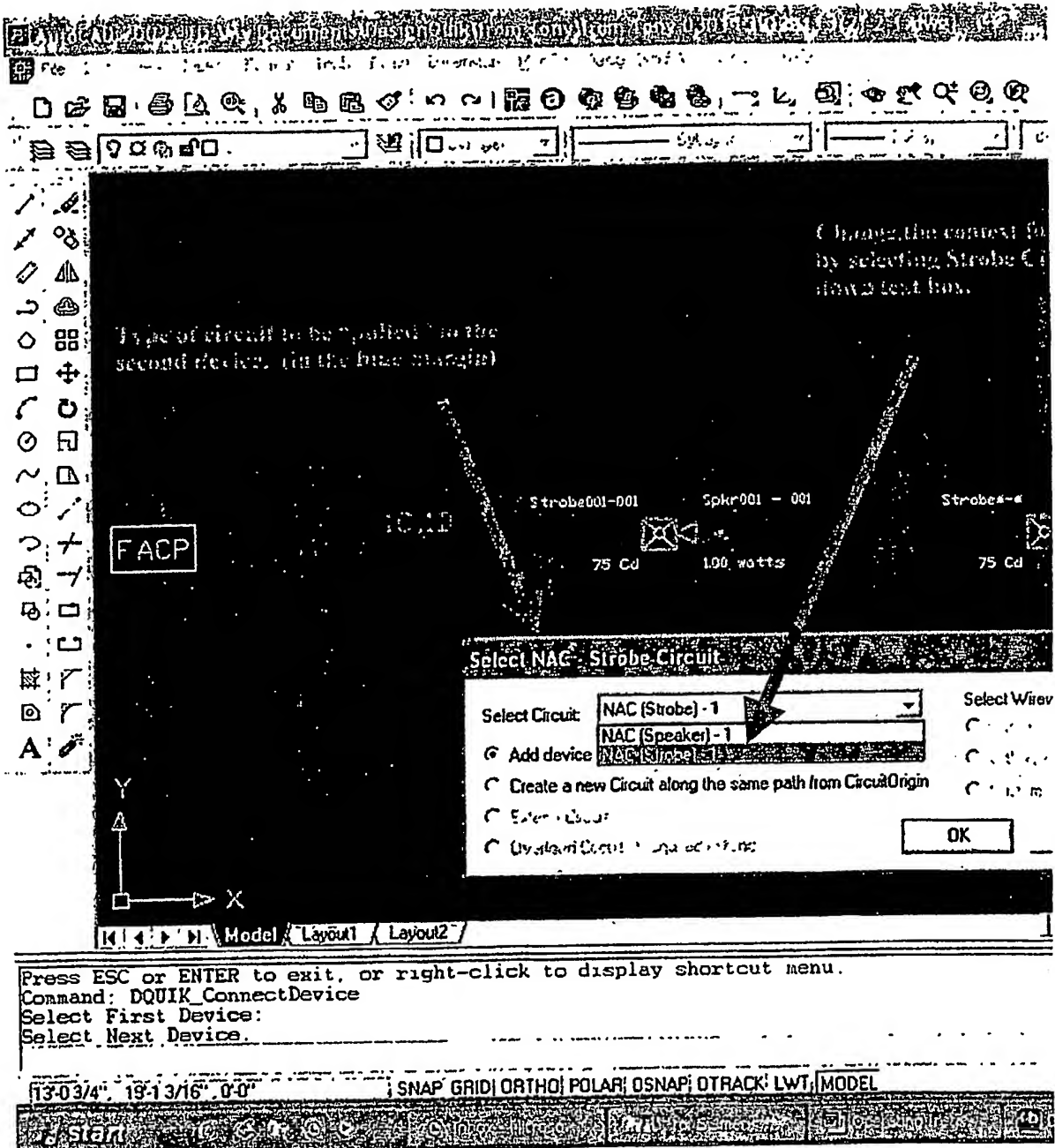


FIG. 49A

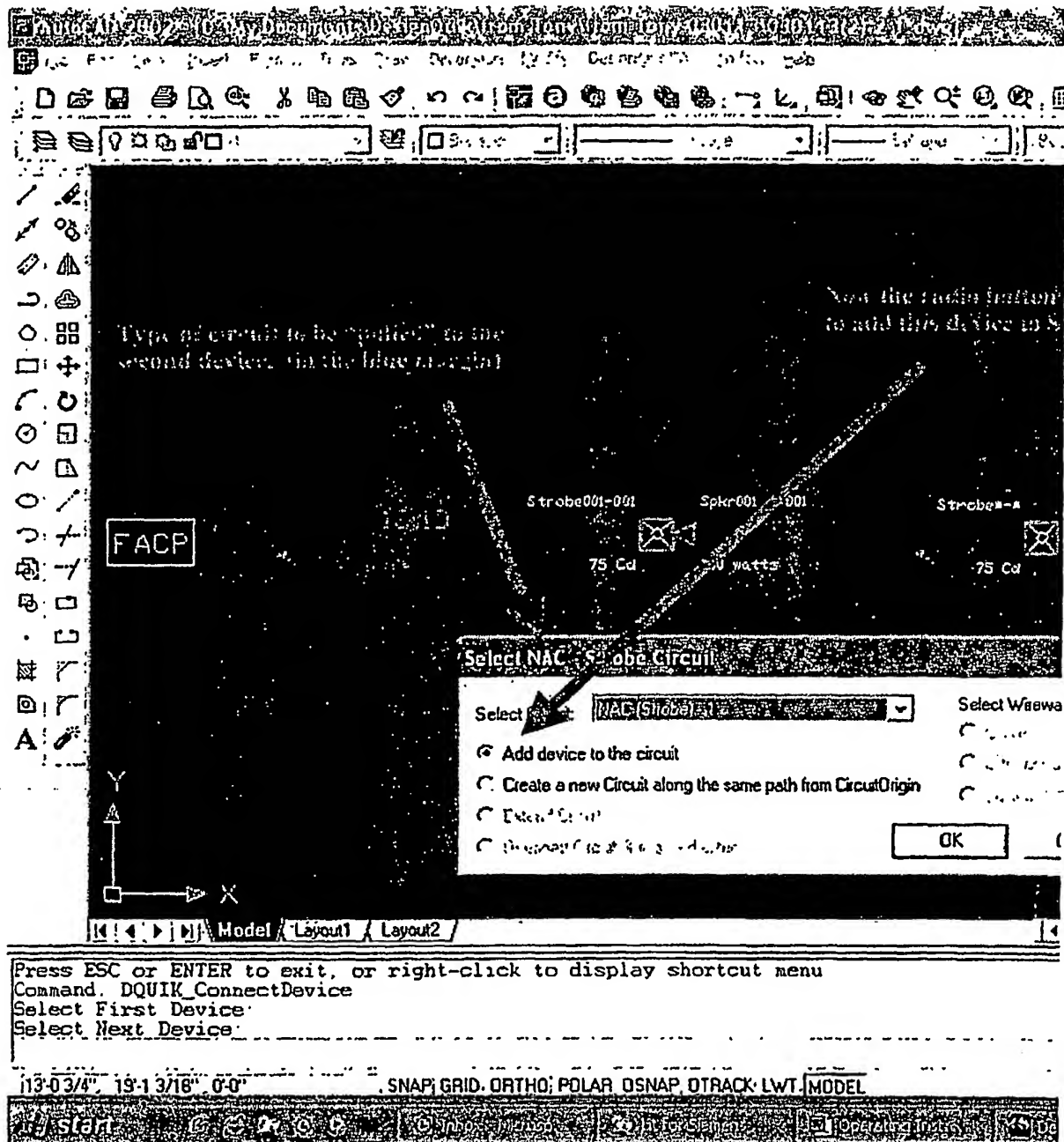


[Previous Page]

[Next Page]

[Return To Beginning]

The radio buttons now include a choice to add the second device to Strobe Circuit 1.



[Previous Page]

[Next Page]

[Return To Beginning]

FIG. 50A

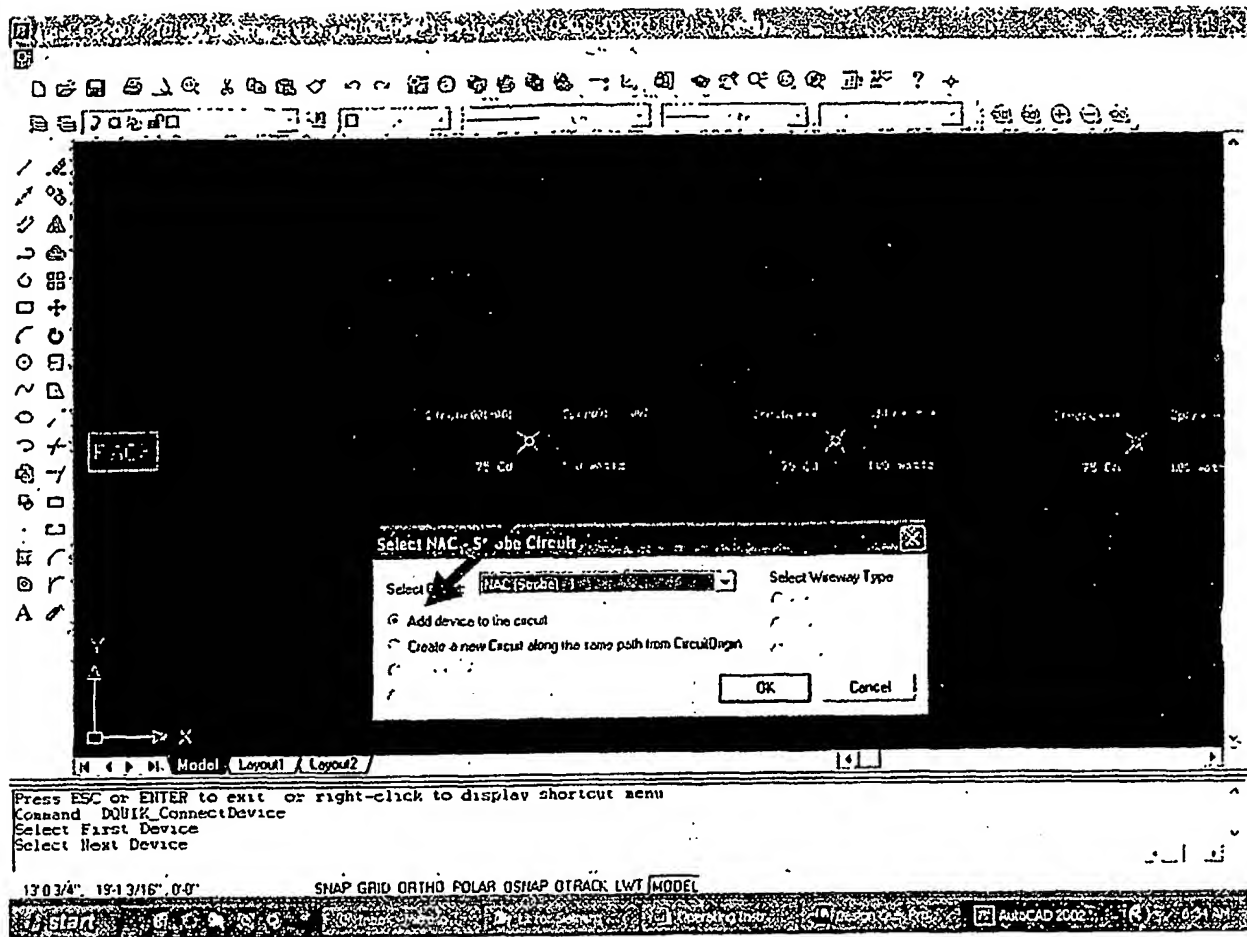


FIG. 50B

[Previous Page]

[Next Page]

[Return To Beginning]

The strobe and speaker circuit connection methods are now complete, so the connection is made. The Command Line prompts the user to continue by selecting another device for connection. At any time, the user can cancel the Connect Devices command by right click of the mouse or with the <Escape> key.

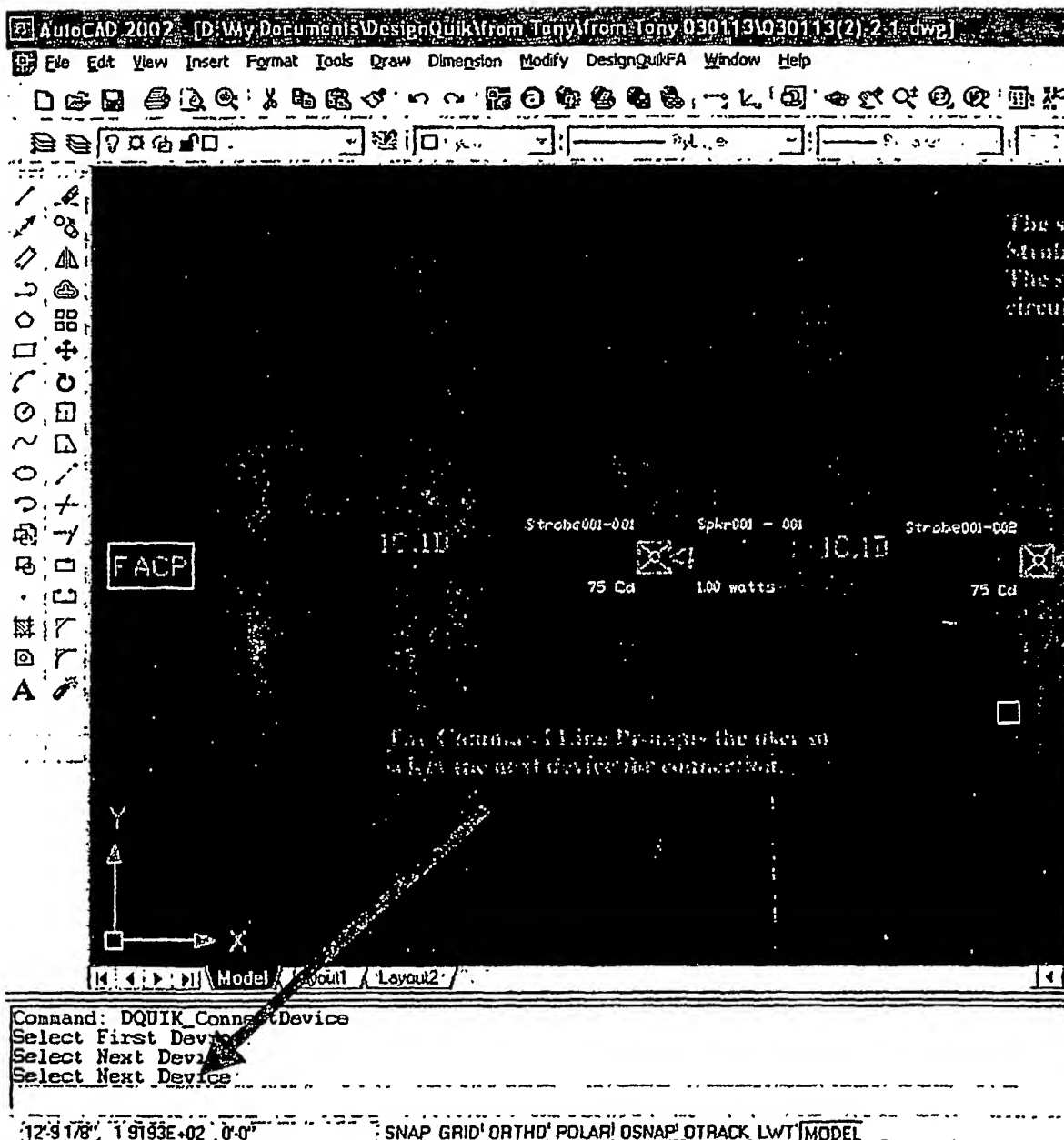


FIG. 51A

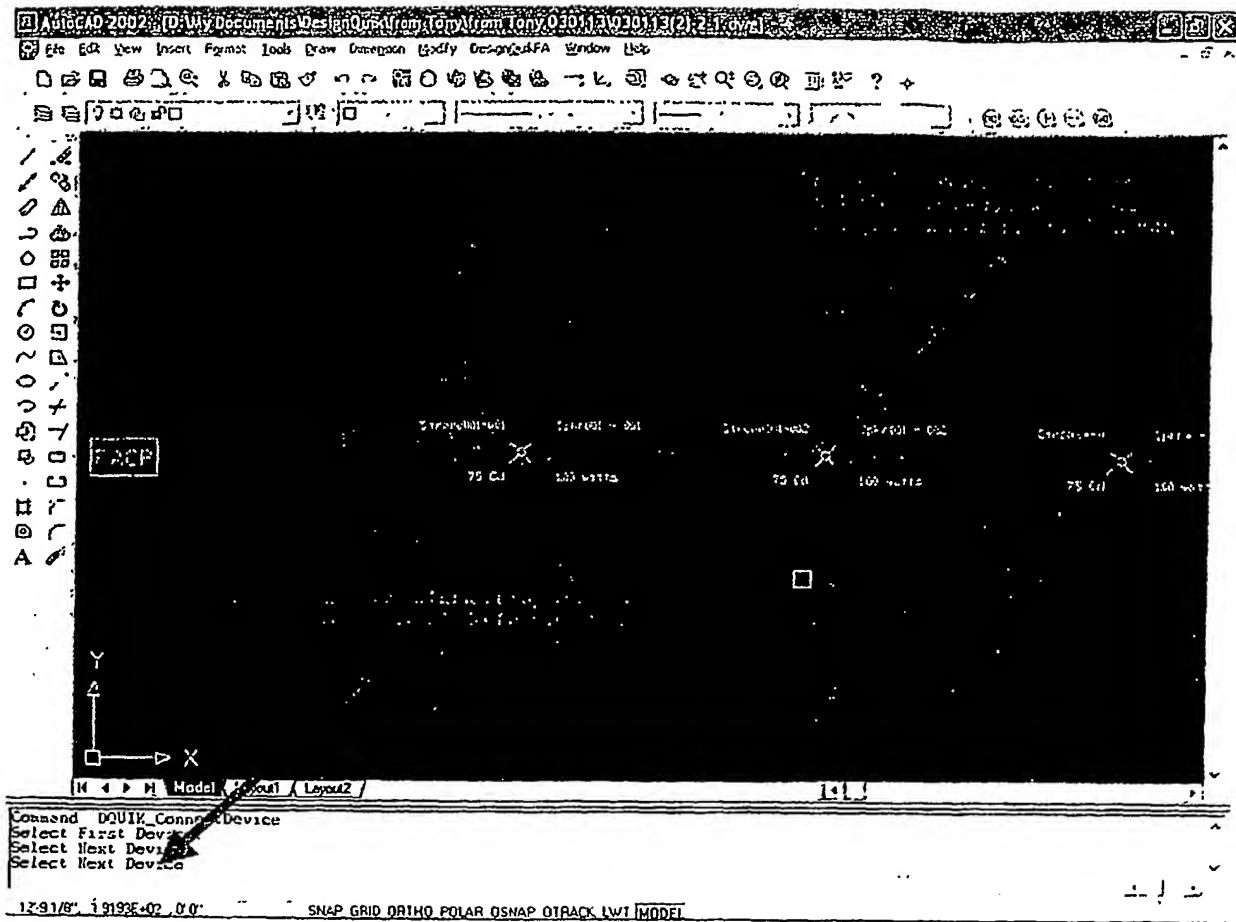


FIG. 51B

[Previous Page]

[Next Page]

[Return To Beginning]

The entire circuit of devices may be connected without exiting the Connect Devices command. Alternatively, the command may be canceled after connection of any device, then the Connect Devices command can be re-entered, and connection resumed by clicking on the LAST CONNECTED device, then the next FREE DEVICE, etc.

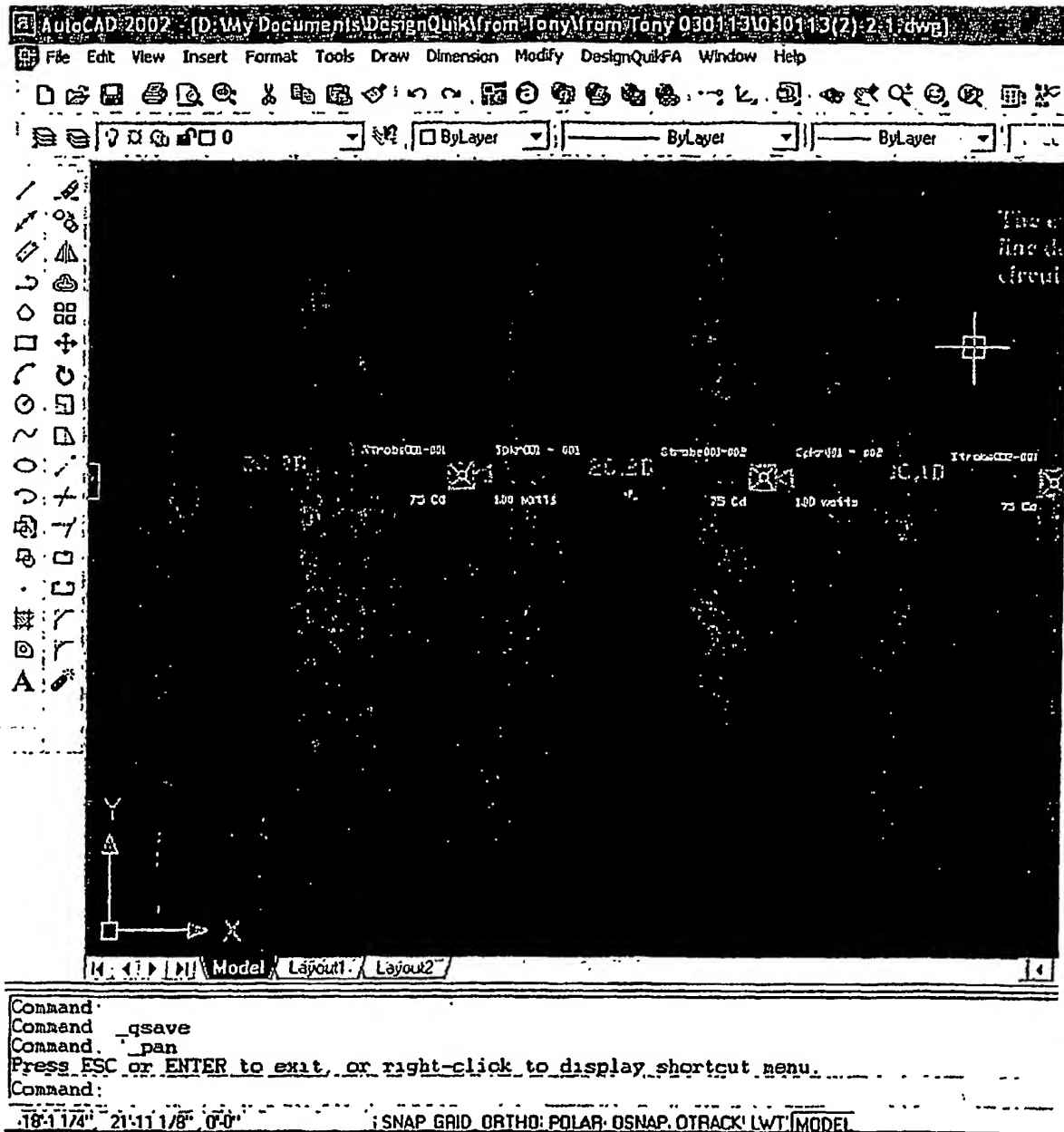


FIG. 52A

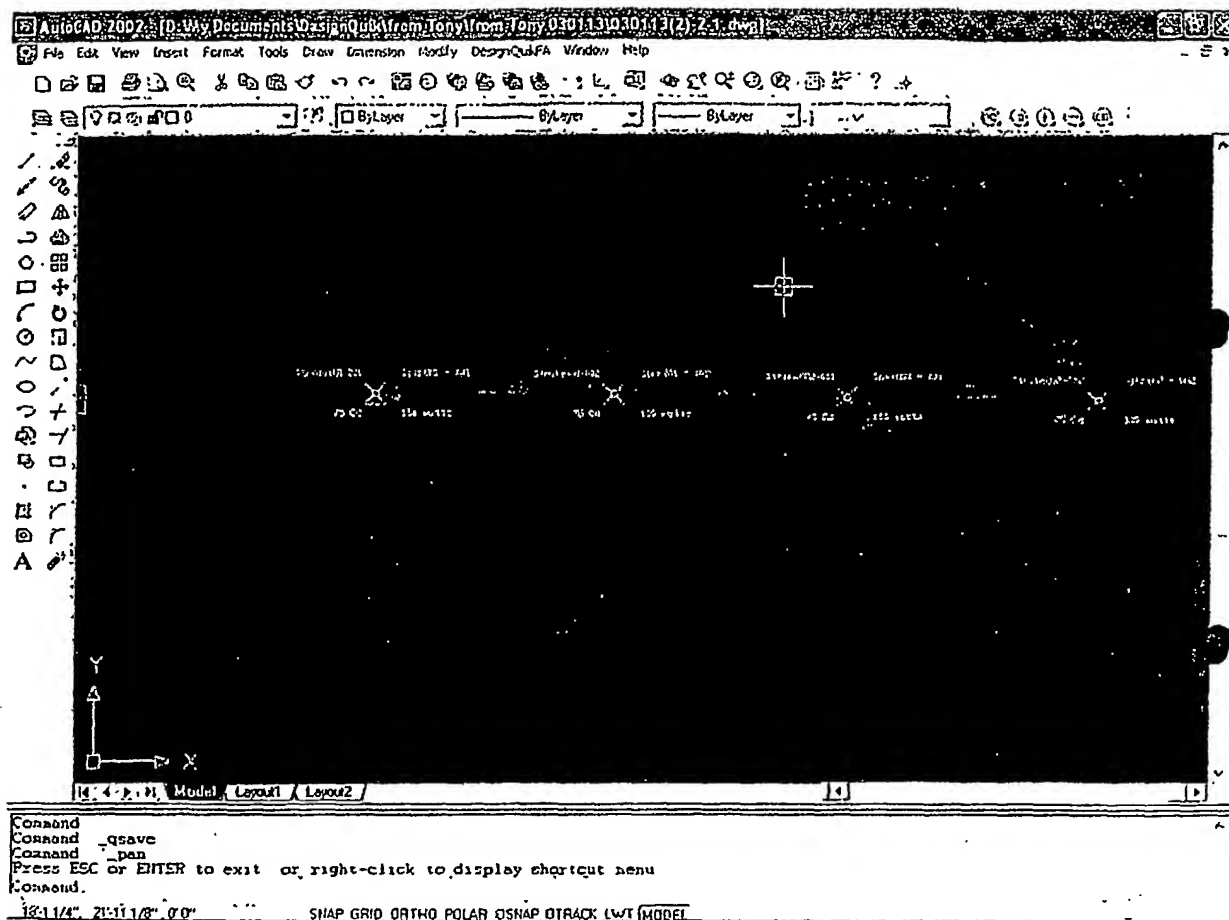


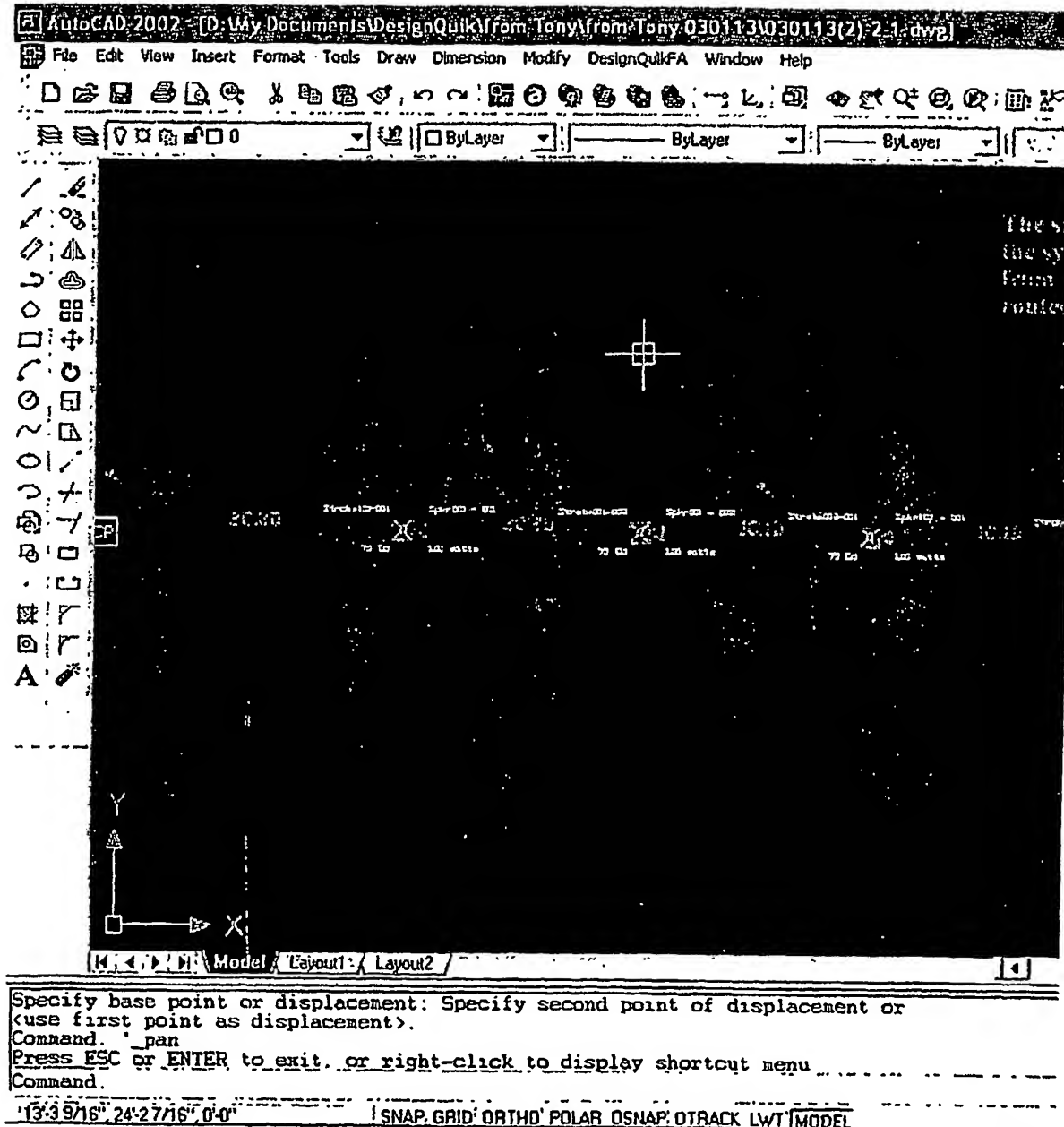
FIG. 52B

[\[Previous Page\]](#)

[Next Page]

[Return To Beginning]

Now to include an addressable smoke detector in the system. The software automatically will choose a Signaling Line Circuit (SLC) for connecting this device. The user has the option of routing the SLC directly from the FACP in its own wireway, or through the existing wireway. For this example, the SLC will be routed through the existing wireway.



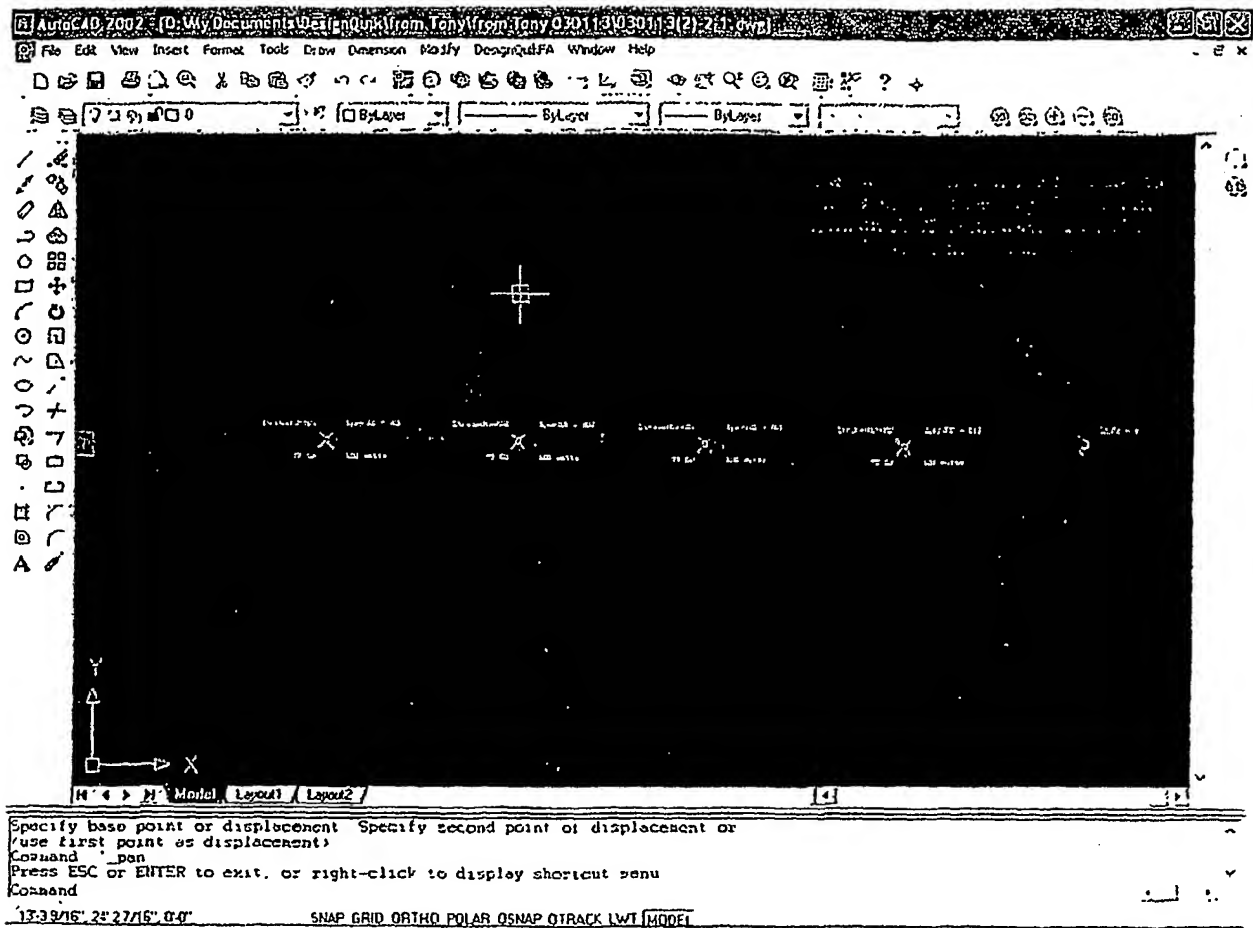


FIG. 53B

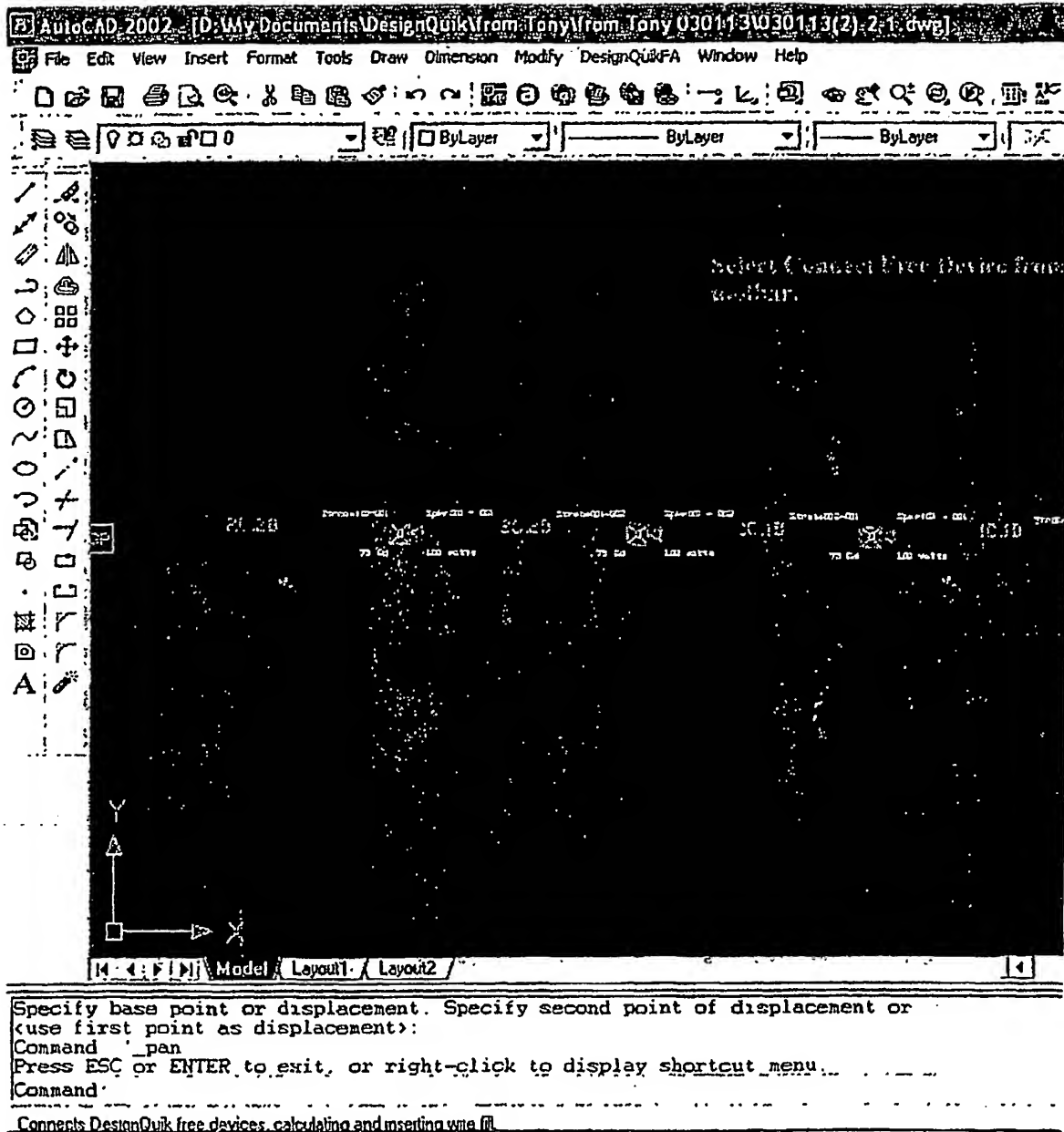
[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)[\[Previous Page\]](#)[\[Next Page\]](#)[\[Return To Beginning\]](#)

FIG. 54A

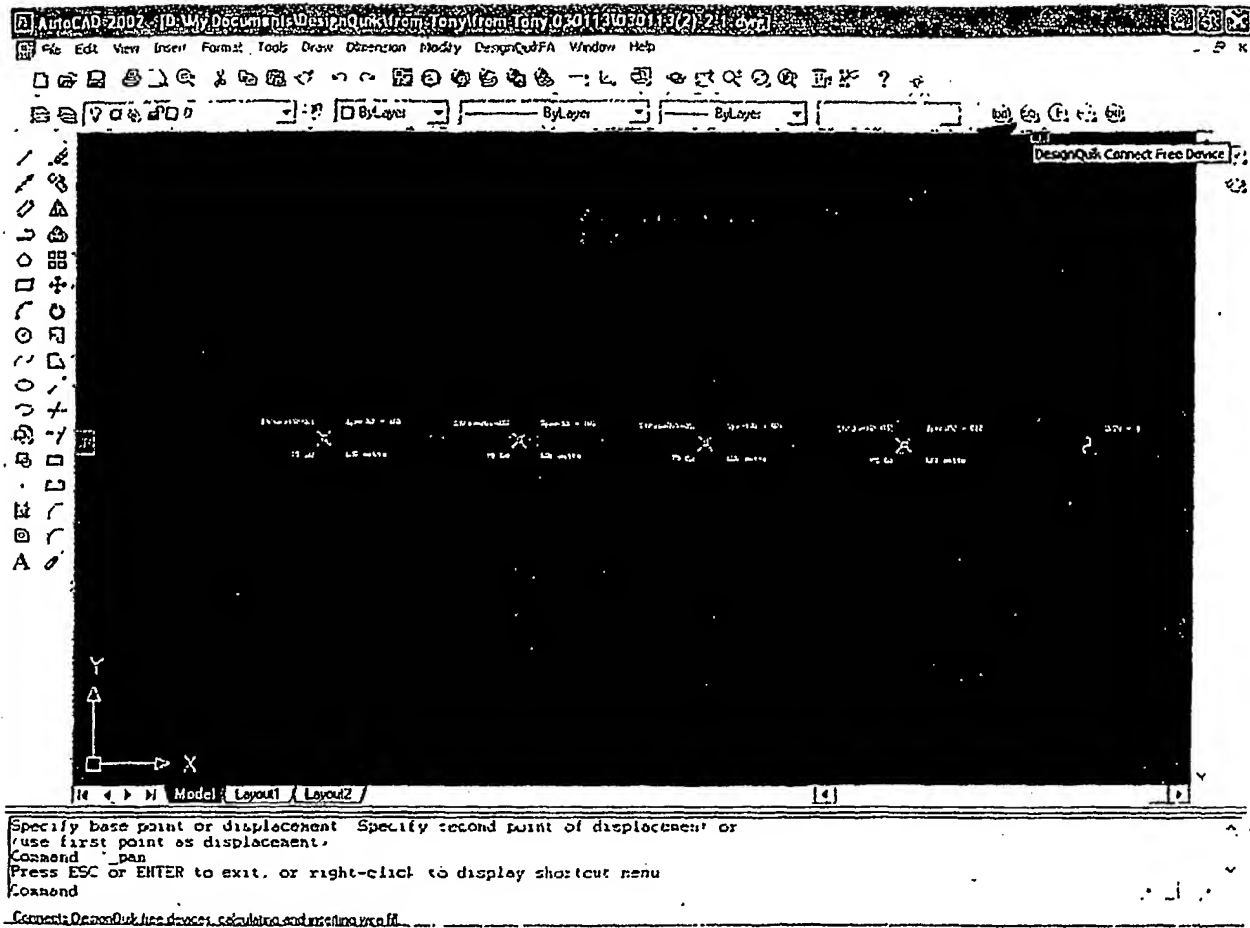
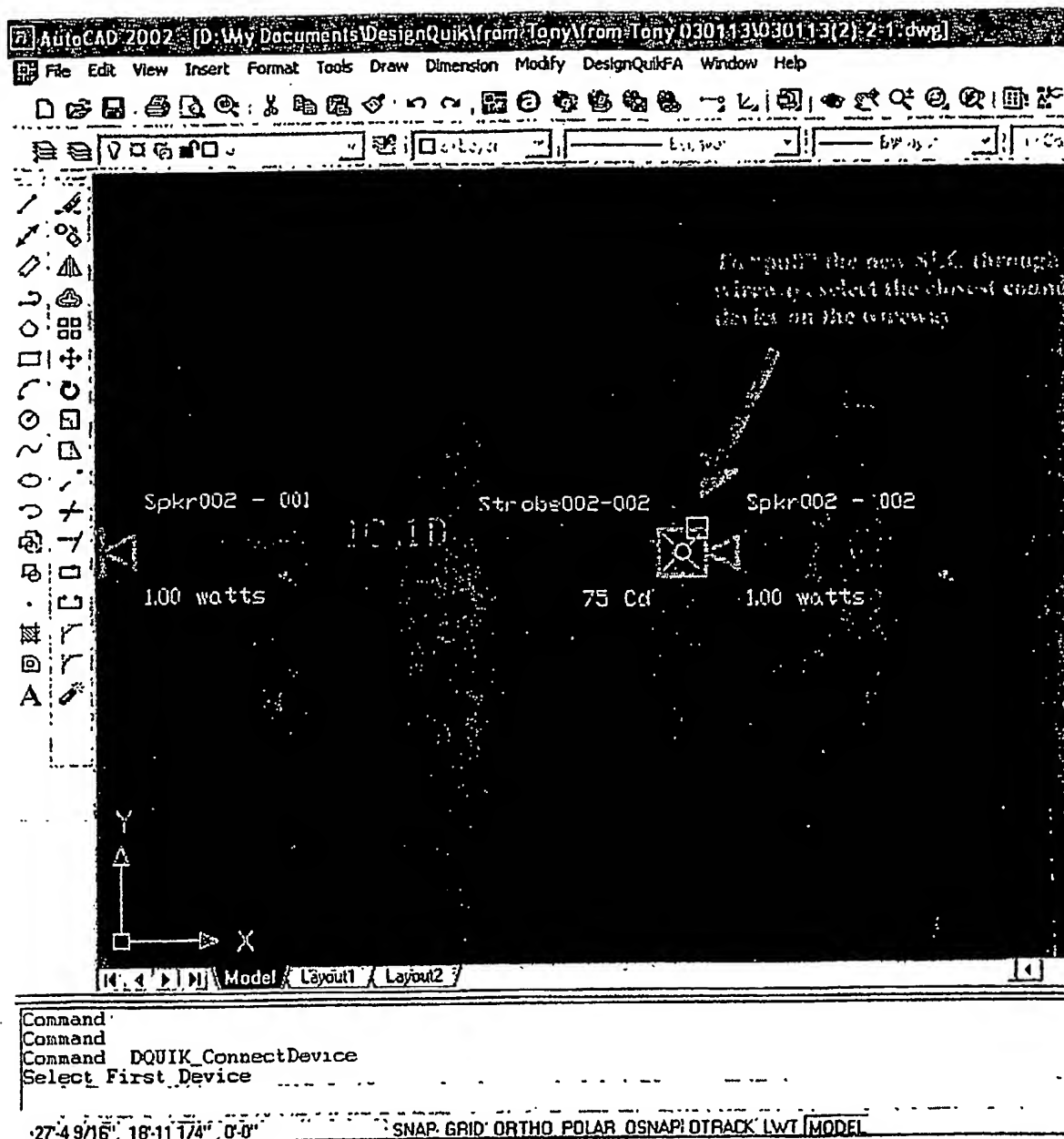


FIG. 54B

[Previous Page]

[Next Page]

[Return To Beginning]



[Previous Page]

[Next Page]

[Return To Beginning]

FIG. 55A

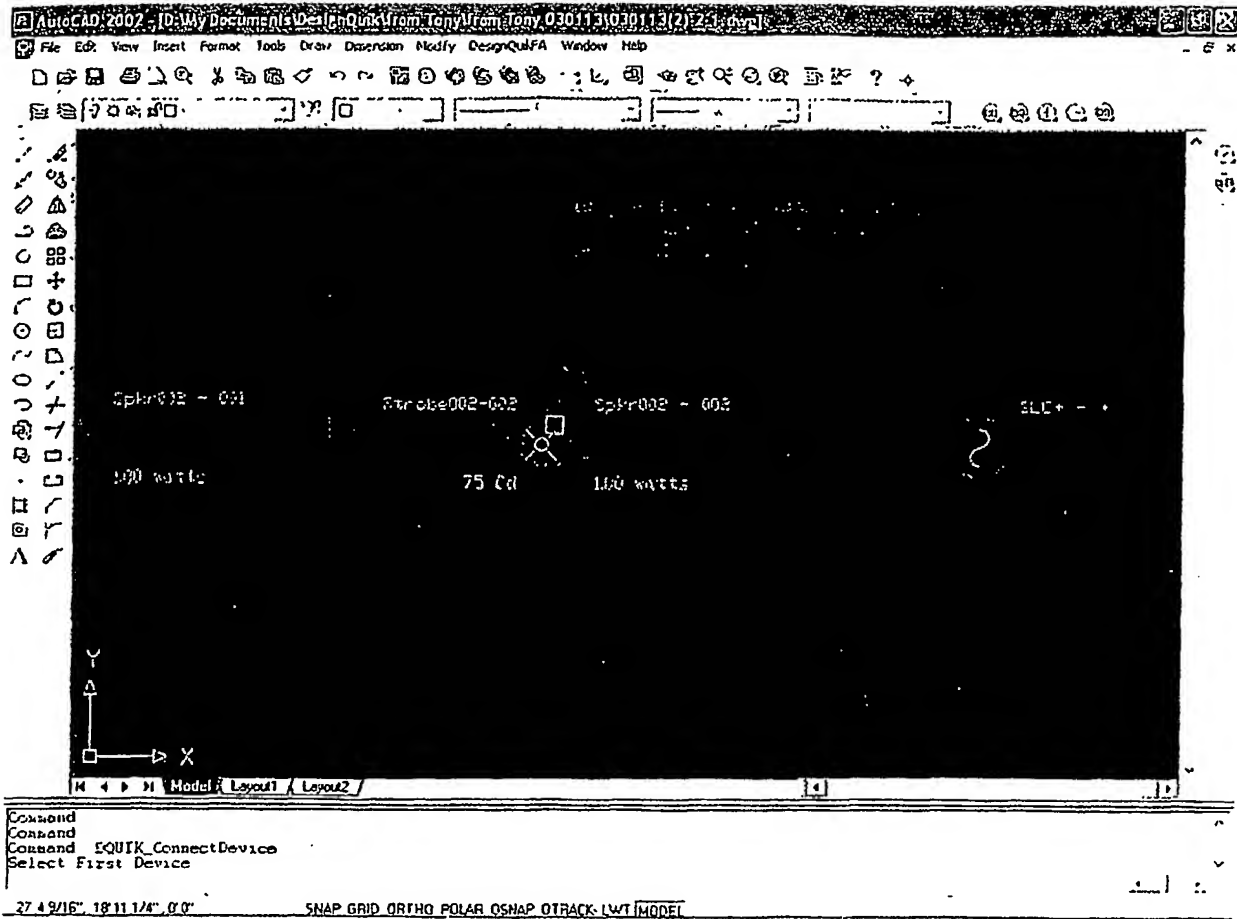


FIG. 55B

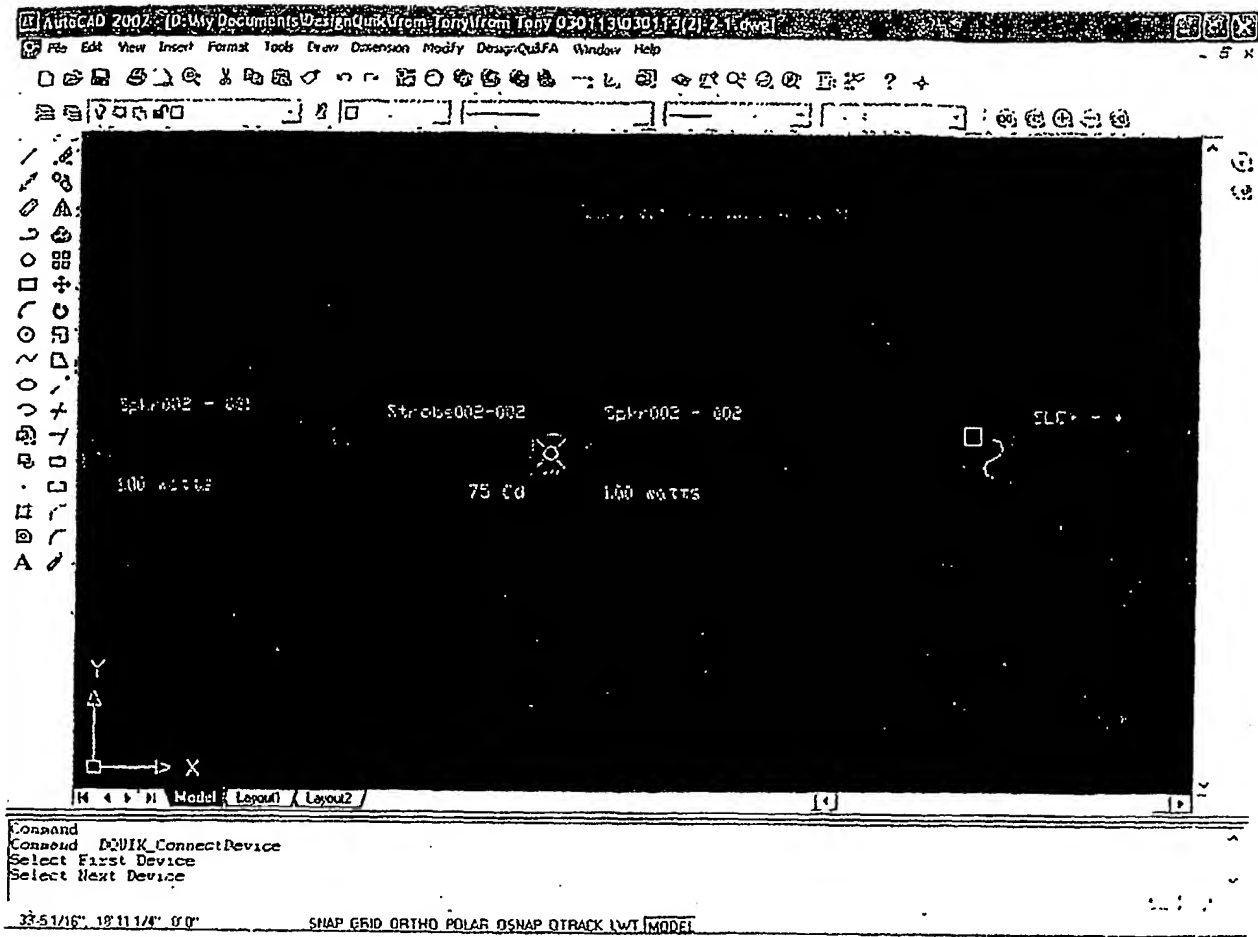


FIG. 56

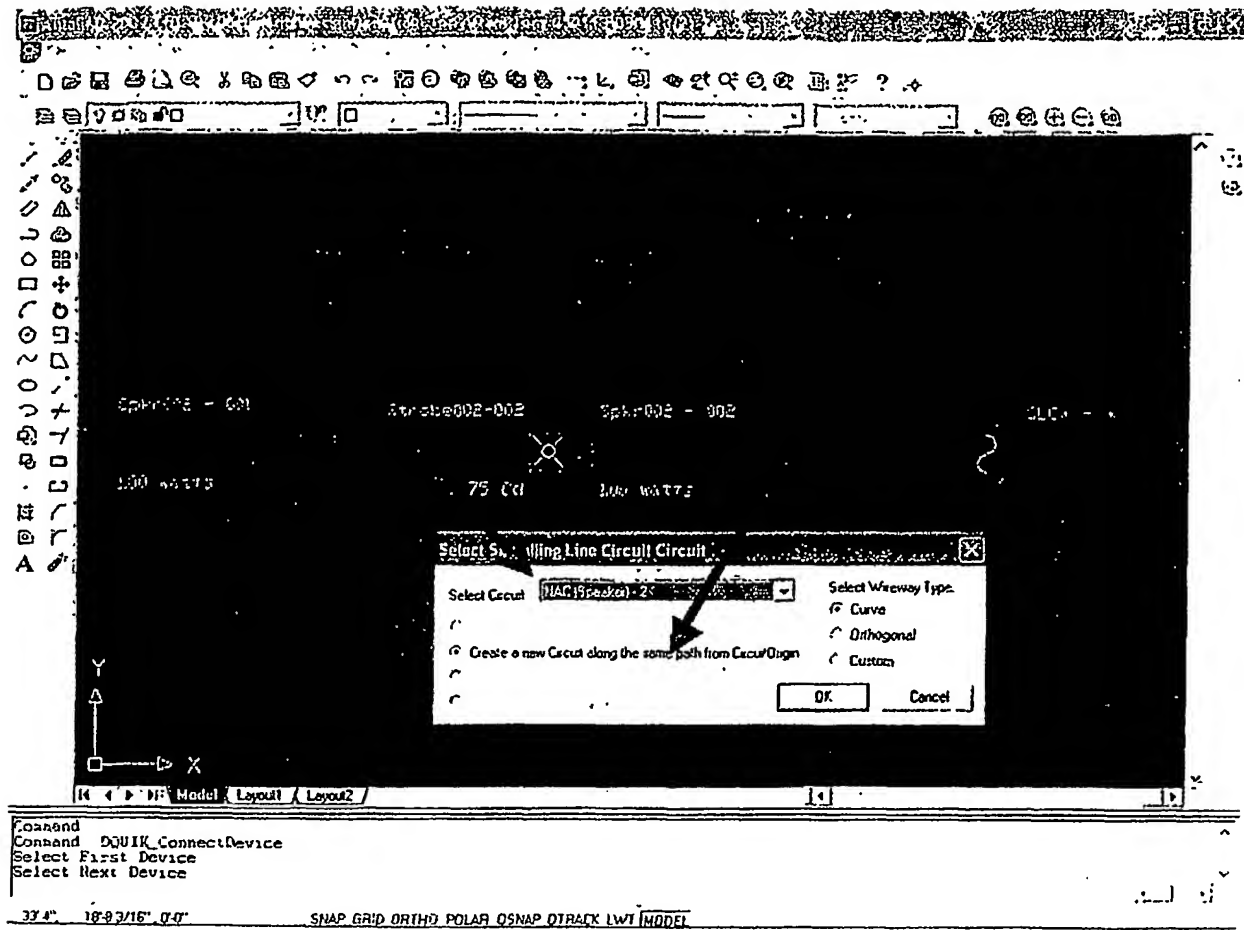


FIG. 57

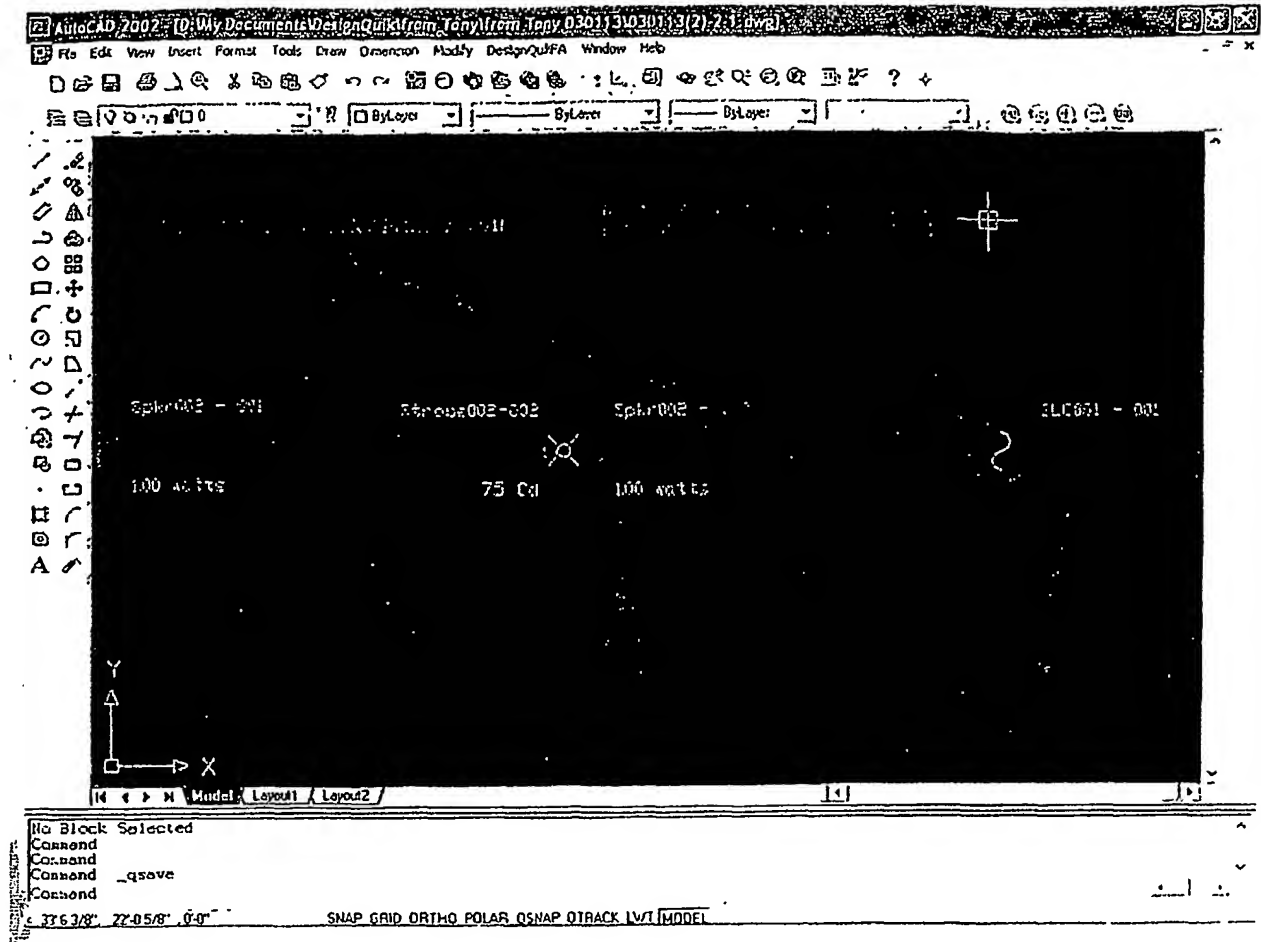


FIG. 58

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